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Early Opposition to the Steam Railroad



By

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Foreword

ONE of the significant achievements of the twentieth century has been the improvement in the methods of highway transportation brought about by the use of the motor vehicle. There are today some twenty million passenger cars and trucks registered in the United States. So completely has the motor vehicle entered into our daily life, so closely has it become associated with virtually every kind of human activity conducted for business or for pleasure, so numerous and extensive have become the business enterprises connected directly or indirectly with its manufacture, distribution, operation and maintenance, that it is difficult to realize that twenty-five years ago the "horseless carriage" was still regarded as a mechanical experiment of doubtful promise. The generation now living has witnessed a revolution in the art of transportation as remarkable in its character as the revolution which followed the invention of the steam locomotive.

Notwithstanding its recent origin the automobile industry now ranks first among the manufacturing industries of the United States. Originally designed as a private passenger conveyance, to be used chiefly for pleasure and recreation, the motor car has become a vehicle of the business world, widely used to carry both passengers and freight.

As a carrier for hire the motor vehicle was for a time limited to passenger service over definite routes in a few of our larger cities and to the special and more or less irregular services once performed by horse-drawn cabs and drays. During the past few years its field of operation has been extended. There has been a greatly increased use of motor buses in cities, and in many parts of the country motor buses are affording a regularly scheduled suburban and inter-urban transportation service. The motor truck has found its place in distributional services and is now largely engaged in the carriage of commodities by privately owned vehicles over short distances. In other words the motor vehicle is providing on the highways a transportation service very similar to that long given exclusively by steam and electric railways.

It was inevitable that the motor vehicle should absorb a part of the traffic of the railways. Private cars and trucks took some

business from the rail carriers, and the common carrier buses, offering in many instances a directly competitive service, have taken more.

When the motor vehicle first came into general use the steam and electric railways had long been without rivals of any consequence. It was hardly to be expected that they would look with favor upon the advent of a sturdy and vigorous competitor. They did not relish the diversion of traffic to private motor facilities, but there was little or nothing they could do to check this loss. The carriers for hire, whether trucks or buses, were different. They were distinctly business rivals to which combat could be and was given.

Representatives of railways urged the adoption of legislative and administrative policies which would check the expansion of service by motor vehicles for hire. Their vigorous attacks upon the rival transportation agency were based upon an obviously sincere belief that the new form of highway transportation was wasteful and unnecessary, though their disparaging statements did not always show clear evidence of a serious and patient effort to find out if motor vehicle service could be justified upon grounds of economy and efficiency.

The manufacturers and operators of motor vehicles for the most part refrained from acrimonious controversy. They were willing to let time settle the issue, confident that the public not only would tolerate but would demand the use of the motor vehicle wherever it could render meritorious service. The events of the past few years have justified this attitude.

A feature of the opposition to the motor vehicle which interested me was its similarity to the antagonism with which many other mechanical innovations have been met in times past. I was familiar with the fact that the steam railroad, in its early days, had not been acclaimed with universal approval, and I requested Mr. Van Metre to prepare for me a brief account of the early opposition to steam railway development.

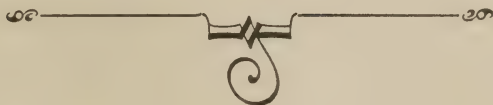
Though this account was written more than four years ago, I hesitated to publish it because I feared the more vigorous opponents of motor vehicle transportation might infer that I questioned their motives. While I felt that the validity of some of their arguments might be denied, I did not doubt the sincerity of their convictions, and I had no desire to take part in a fruitless dispute.

Conditions have changed materially since this article was written. The prejudice against the motor vehicle as a carrier for hire has largely melted away, and many individuals who were once its most earnest enemies, convinced by the logic of events, are now among its staunchest friends. Steam railroad companies are purchasing fleets of motor trucks for their own use or are contracting with motor haulage companies to transport freight which experience has shown can be hauled in motor trucks more economically than in railroad freight cars. Street railway companies and steam railroads are finding the motor bus a means of improving and enlarging their service. The motor vehicle is finding its proper place in the transportation system, and the public is obtaining the advantages of its manifest economies.

Under the circumstances I can give publicity to this article with no danger of being misunderstood. It is being published, not in a spirit of criticism, but with the thought of making possible a clearer understanding of some of the difficulties through which the motor vehicle industry has recently passed.

A. J. BROSSAU.

Early Opposition
to the
Steam Railroad



Early Opposition to the Steam Railroad

OF all the mechanical improvements of the nineteenth century there was perhaps none which had a more pronounced effect upon economic progress than the steam railroad, certainly none which had a greater influence upon the economic progress of the United States. It has been said recently that the United States represents an "experiment in transportation." The history of the country is primarily the record of the march of a vigorous people across a wide belt of the North American continent. This march could not have been accomplished without the aid of the steam railroad.

When one considers how great a factor the railroad has been in the development of the United States, one would hardly suppose that this great instrument of progress was introduced in this country only with the greatest difficulty and came into general use in the face of the most bitter opposition. Yet such was the case. During its inception and during the early years of its history the steam railroad was regarded in many quarters as new devices are frequently regarded—first as impossible, then as impracticable, and then as uneconomical and undesirable. New ideas do not often receive a respectful hearing. Pioneers in discovery and invention are frequently regarded as misguided fools or harmless lunatics rather than as men of wisdom and foresight. The steam locomotive was conceived in the minds of several individuals nearly a half century before it was constructed, but these individuals, like those who gave the world the steamboat, the reaper, the electric telegraph, the sewing machine, the first Atlantic cable, the automobile and the airplane, were generally regarded as dreamers and victims of delusions. The early partial successes with steam as motive power, both for land and for water transportation, were looked upon more as demonstrations of futility than as promises of great things to come.

When the steam locomotive became a success—established beyond doubt—the problem of creating a steam railway transportation service was by no means solved. The railroad was not a universally popular institution. It was too new. There are always people who believe that anything new is inferior, merely because it is new. They have lived in the "good old days," and they witness with reluctance any tendency to abandon the "good old ways." In the early days of the railroad there were not wanting people who

preferred, as a matter of principle, the lumbering, uncomfortable stage-coach to the faster moving steam passenger train. Not infrequently such people found some justification, because in some parts of the country the stage-coach was a surer and more comfortable means of travel than the early railroad train. The occasional failure of the crude mechanisms first used upon railroads to meet the demands placed upon them was sufficient ground for the assertion that steam railroad transportation was wholly "impracticable." The railroad was said to be inferior to the canal for the carriage of freight and no better than the stage-coach for the carriage of passengers. It would never succeed, and the capital invested in railroad enterprises was destined to be lost. Only those courageous souls who possessed the imagination and vision to anticipate improvements, maintained an unshaken confidence in the new agency of trade and travel.

The chief opposition to the steam railroad came, however, from those who had a vested interest in transportation facilities which the railroad was destined to supplant. For a generation the owners of canals and turnpikes opposed the construction of railroads. Other vested interests whose business was endangered by the progress of steam railway transportation placed every obstacle at their command in the way of the development of an efficient railroad service.

The Railroad Pioneers

Probably the first American to become interested in the possibilities of steam as a motive power for land transportation was Oliver Evans, a Philadelphia mechanic, who was one of the first manufacturers of steam engines in the United States. He was an inventor of considerable renown, and he contributed many improvements to the steam engine. In 1812 Evans wrote an account of his experiments with "steam waggons." This account, published in *Niles' Weekly Register* (Vol. III, *Addenda*, 2-6), began as follows:

About the year 1772, being then an apprentice to a wheel-wright, or waggon-maker, I labored to discover some means of propelling land carriages, without animal power. All the modes that have since been tried (as far as I have heard of them) such as wind, treadles with ratched wheels, crank tooth, etc., to be wrought by men, presented themselves to my mind, but were considered too futile to deserve an experiment and I concluded that such motion was impossible for want of a suitable original power.

But one of my brothers, on a Christmas evening, informed me that he had that day been in company with a neighboring blacksmith's boys; who, for amusement, had stopped up the touch hole of a gun barrel, then put in about a gill of water and rammed down a tight wad—after which they put the breech in a smith's fire; when it discharged itself with a *crack* as if it had been loaded with powder.

It immediately occurred to me that here was the power to propel any waggon, if I could only apply it; and I sat myself to work to find out the means. I labored for some time without success. At length a book fell into my hands describing the old atmospheric *steam engine*; I was astonished to observe that they had so far erred as to use the steam only to form a vacuum to apply the mere pressure of the atmosphere, instead of applying the elastic power of the steam for original motion, the power of which I supposed irresistible.

I renewed my studies with increased ardor and soon declared that I could make *steam waggons*, and endeavored to communicate my ideas to others; but however practicable the thing appeared to me, my object only excited the ridicule of those to whom it was made known. But I persevered in my belief, and confirmed it by experiments that satisfied me of its reality.

In the year 1786 I petitioned the legislature of *Pennsylvania* for the exclusive right to use my improvements in flour mills, as also steam waggons, in that state. The committee to whom my petition was referred heard me very patiently while I described my *mill* improvements, but my representations concerning the *steam waggons* made them think me insane. ✕

A similar petition was also presented to the legislature of *Maryland*. Mr. Jesse Hollingsworth, from *Baltimore*, was one of the committee appointed to hear me and report on the case. I candidly informed the committee of the fate of my application to the legislature of *Pennsylvania* respecting the steam waggons—declaring, at the same time, without the encouragement prayed for, I would never attempt to make them, but that, if they would secure to me the right as requested, I would, as soon as I could, apply the principles to practice; and I explained to them the great elastic power of steam, as well as my mode of applying it to propel waggons. Mr. *Hollingsworth* very prudently observed, that the grant would injure no one, for he did not think that any man in the world had thought of such a thing before; he therefore wished the encouragement might be afforded, as there was a prospect that it would produce something useful. That kind of argument had the desired effect, and a favorable report was made, May 21, 1787, granting to me, my heirs and assigns, for 14 years, the exclusive right to make and use any improvements in flour mills and the steam waggons, in that state. From that period I have felt myself bound in honor to the State of *Maryland* to produce a steam waggon, as soon as I could conveniently do it.

Evans went on to say that he was unable to interest anybody with capital in his idea of a steam wagon, and he was therefore compelled to give up for several years all thought of executing his project. He continued, however, to think about the matter, and never gave up the conviction that he could construct a steam wagon. He also conceived the idea of building a steamboat propelled by paddle-wheels.

Finally in 1801 he began the construction of a steam-wagon at his own expense. He communicated his ideas to some scientists of Philadelphia, one of whom, B. H. Latrobe,

publicly pronounced them chimerical, and attempted to demonstrate the absurdity of my principles, in his report to the *Philosophical Society of Pennsylvania* on steam engines; in which same report he also made attempts to show the impossibility of making steamboats useful, on account of the weight of the engine; and I was one of the persons alluded to, as being seized with the *steam mania*, conceiving that waggons and boats could be propelled by steam engines. The liberality of the members of the society caused them to reject that part of the report which he designed as a demonstration of the absurdity of my principles; saying they had no right to set up their opinions as a stumbling block in the road of any exertions to make a discovery. They said, I might produce something useful, and ordered it to be stricken out. What a pity they did not also reject his demonstrations respecting steamboats! for notwithstanding them, they have run, are now running and will run; so has my engine and all its principles completely succeeded—and so will land carriages as soon as these principles are applied to them, as explained to the legislature of *Maryland* in 1787, and to others long before.

Though Evans made some progress in the construction of the steam wagon which he started in 1801, he was diverted from this enterprise because of greater promise of profit in building engines for flour mills and other manufacturing establishments. Though he never returned to his project of the steam wagon, he carried out an interesting experiment in 1804 which he regarded as a successful demonstration of the feasibility of his plan. The experiment he described as follows:—

In the year 1804, I constructed at my works, situated a mile and a half from the water, by order of the board of health of the city of Philadelphia, a machine for cleansing docks. It consisted of a large flatt, or scow, with a steam engine of the power of five horses on board, to work machinery to raise the mud into flatts. This was a fine opportunity to show the public that my engine could propel both land and water carriages, and I put wheels under it, and though

it was equal in weight to *two hundred barrels of flour*, and the wheels fixed with wooden axletrees, for this temporary purpose, in a very rough manner, and with great friction, of course, yet with this small engine I transported my great burden to the *Schuylkill* with ease, and, when it was launched in the water, I fixed a paddle wheel at the stern, and drove it down the *Schuylkill* to the *Delaware* and up the *Delaware* to the city, leaving all the vessels going up behind me, at least, half way, the wind being a-head.

Some wise men undertook to ridicule my experiment of propelling this great weight on land, because the motion was too slow to be useful. I silenced them by answering, that I would make a carriage to be propelled by steam, for a bet of \$3000, to run upon a level road against the swiftest horse they could produce. I was then as confident, as I am now, that such velocity could be given to carriages. . . .

I am willing to make a steam carriage that will run 15 miles an hour, on good level rail ways, on condition that I have double price if it shall run with that velocity, and nothing for it, if it shall not come up to that velocity. . . .

His offer had no effect, and there was nobody who had enough confidence in his proposals to advance the few thousand dollars needed for a thorough trial of his "principles." Though disappointed with the results of his efforts to introduce steam transportation by land, Evans viewed the situation philosophically, remarking:

When we reflect upon the obstinate opposition that has been made by a great majority to every step toward improvement; from bad roads to turnpikes, from turnpikes to canals; from canals to rail-ways for horse-carriages, it is too much to expect the monstrous leap from bad roads to rail-ways for steam carriages, at once. One step a generation is all that we can hope for. If the present shall adopt canals, the next may try rail-ways with horses, and the third generation use the steam carriages.

The Latrobe to whom Evans referred was Benjamin Henry Latrobe, the architect. He assisted in designing a number of the first public buildings erected at Washington, and after the War of 1812 he designed the Capitol which replaced the building partly destroyed by the British. He was a prominent member of the American Philosophical Society, and like the other members of that organization, he displayed an active interest in the development of the various branches of science. He had little confidence, however, in the steam engine as a useful source of power for transportation. In a report made to the Society in 1803 on the improvements made in

steam engines in America (the report mentioned by Evans) he said:¹

During the general lassitude of mechanical exertion which succeeded the American revolution, the utility of steam-engines appears to have been forgotten; but the subject afterwards started into very general notice, in a form in which it could not possibly be attended with much success. A sort of mania began to prevail, which indeed has not yet entirely subsided, for impelling boats by steam-engines.

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Nothing in the success of these experiments appeared to be of sufficient compensation for the expense, and the extreme inconvenience of the steam-engine in the vessel.

There are indeed general objections to the use of steam engines for impelling boats, from which no particular mode of application can be free. These are; 1st, The weight of the engine and of the fuel. 2nd, The large space it occupies. 3rd, The tendency of its action to rack the vessel and render it leaky. 4th, The expense of maintenance. 5th, The irregularity of its motion, and the motion of the water in the boiler and cistern, and of the fuel vessel in rough water. 6th, The difficulty arising from the liability of the paddles or oars to break, if light; and from the weight, if made strong. Nor have I ever heard of an instance, verified by other testimony than that of the inventor, of a speedy and agreeable voyage having been performed in a steamboat of any construction.

The subsequent success of the steamboat apparently did not warn Latrobe that the steam engine might also be successfully applied in a practical way to land transportation. He left also a record of his lack of confidence in railroads. This record is a part of a letter written to Albert Gallatin in 1808. Gallatin, while Secretary of the Treasury, was requested by the Senate, on March 2, 1807, to prepare a report upon the conditions of internal transportation in the United States. In preparing the report Gallatin secured the opinions of a number of prominent Americans. These opinions were published as a part of the report, and among them appears a communication from Latrobe. He was the only one of the correspondents to make any reference to the possibility of railroad transportation, and his opinion was almost wholly unfavorable. In his letter he described the methods of railroad construction and gave an estimate of costs. He was somewhat behind the times in his knowledge of railroads, however, because his description showed the rails equipped

¹*American Philosophical Society Transactions*, VI, 89.

with flanges, instead of the wheels of the vehicles. His final conclusions were as follows:¹

. . . On a good railroad, descending under an angle of only one degree, one horse may draw eight tons in four wagons of two tons each without difficulty. The astonishing loads drawn upon railroads by horses in England has induced many of our citizens to hope for their early application to the use of our country. I fear this hope is vain excepting on a very small scale, and that chiefly in the coal country near Richmond; for it is evident that upon a railroad no other carriage but that which is expressly constructed for the purpose, can be employed; and that to render a railroad sufficiently saving of the expense of common carriage, to justify the cost of its erection, there must be a great demand for its use. But the sort of produce which is carried to our markets is collected from such scattered points and comes by such a diversity of routes, that railroads are out of the question as to the carriage of common articles. Railroads, leading from coal mines to the margin of the James River, might answer their expenses, or others from the marble quarries near Philadelphia to the Schuylkill. But these are the only instances, within my knowledge, in which they at present might be employed.

There is, however a use for railroads as a temporary means to overcome the most difficult parts of artificial navigation; and for this use they are invaluable, and in many instances offer the means of accomplishing distant lines of communication which might remain impracticable, even to our national means, for centuries to come.

Just a few weeks before this letter was written, Latrobe's second son, also named Benjamin Henry, was born. He became one of the most distinguished of the early American railway engineers, and was for many years the chief engineer of the Baltimore and Ohio Railroad, superintending the construction of that line across the Alleghany Mountains.

Another early advocate of railroad transportation in the United States was John Stevens of New Jersey. Stevens was perhaps the greatest of early American inventors. Throughout his life he showed a deep interest in the promotion of all kinds of mechanical improvements. Shortly after the organization of the national government he sent a memorial to Congress urging the enactment of a patent law for the protection and encouragement of inventors.

In 1804 he operated on the Hudson River a small steamboat driven by a screw propeller, and he built a paddle-wheel steamboat

¹*American State Papers, Miscellaneous*, 916.

while Fulton was constructing the *Clermont*. By completing his vessel first, Fulton was able to secure a monopoly of steamboat transportation on the waters of New York, and Stevens took his boat by sea to Philadelphia, operating it for several years on the Delaware River.

The success of the steamboat assured, Stevens turned his attention to the use of steam for land transportation. Like Evans, he was thoroughly convinced that such transportation was practicable and feasible. In 1811 he applied to the legislature of New Jersey for a railroad charter. Before action was taken upon this application, he heard that the Board of Commissioners for the Improvement of Inland Navigation in New York was locating the route of a canal to join the Hudson River with Lake Erie. Seeing that perhaps a better opportunity to try out his plan for a steam railroad existed in New York than in New Jersey, he addressed a memorial to the Board, suggesting that a railroad be built instead of a canal. This memorial, together with the reply of the Board, and various other documents, were published by Stevens in 1812, under the title, *Documents Tending to Prove the Superior Advantages of Rail Ways and Steam-Carriages over Canal Navigation*. This little pamphlet was the first important railroad document published in the United States. Evans read it, and in his account of his own experiments with steam wagons, quoted from above, he made this comment:

I have been highly delighted in reading a correspondence between *John Stevens, esq.*, and the commission appointed by the legislature of New York, for fixing on the scite of the great canal proposed to be cut in that state. Mr. Stevens has taken a most comprehensive and ingenious view of this important subject, and his plan for rail-ways for the carriages to run upon, removes all the difficulties that remained.

In the introduction to his booklet, Stevens summarized his opinions on the subject of railroad transportation. He said, "I can see nothing to hinder a steam-carriage from moving on these ways with a velocity of one hundred miles an hour." He qualified this statement somewhat in a foot-note: "This astonishing velocity is considered here as merely possible. It is probable that it may not in practice be convenient to exceed twenty or thirty miles per hour. Actual experiments, however, can alone determine this matter, and I should not be surprised at seeing steam-carriages propelled at the rate of forty or fifty miles per hour." He outlined the advantages

of the steam railroad both for commercial and for military uses. "Armies could be conveyed in twenty-four hours," he said, "a greater distance than it would take them weeks or perhaps months to march." He appealed for the construction of railroads not only on account of their certain usefulness, but as a matter of patriotic pride. He mentioned the fact that he had laid his plans before Congress, hoping that funds might be appropriated from the Federal Treasury to conduct initial experiments. His own position in the matter he described as follows:

Should it, however be destined to remain unnoticed by the general government, I confess I shall feel much regret, not so much from personal as from public considerations. I am anxious and ambitious that my native country should have the honour of being the first to introduce an improvement of such immense importance to society at large, and should feel the utmost reluctance at being compelled to resort to foreigners in the first instance. As no doubt exists in my mind but that the value of the improvement would be duly appreciated, and carried into effect by trans-Atlantic governments, I have been the more urgent in pressing the subject on the attention of Congress. Whatever may be its fate, should this appeal be considered obtrusive and unimportant, or from whatever other cause or motive should be suffered to remain unheeded, I shall still have the consolation of having performed what I conceive to be a public duty.

The memorial itself went into considerable detail. Stevens advocated a railroad instead of a canal on the grounds that the railroad would be cheaper to construct, and that its carrying capacity would be far greater than that of a canal.

The Board submitted Stevens' memorial to a committee for investigation and report. Before the committee rendered an opinion, Robert R. Livingston, a member of the Board, wrote to Stevens expressing his doubt as to the feasibility of the plan for railways. He said:

I fear, on mature reflection, that they will be liable to serious objections, and ultimately more expensive than a canal. They must be double, so as to prevent the danger of two such heavy bodies meeting. The walls on which they are placed must be at least four feet below the surface, and three above, and must be clamped with iron, and even then they would hardly sustain so heavy a weight as you propose moving at the rate of four miles an hour on wheels. As to wood, it would not last a week: they must be covered with iron, and that too very thick and strong. The means of stopping these from running upon each other, (for there would be many on the

road at once) would be very difficult. In case of accidental stops or the necessary stops to take wood and water, etc., many accidents would happen. The carriage of condensing water would be very troublesome. Upon the whole, I fear the expense would be much greater than that of canals, without being so convenient.

To Livingston's letter Stevens wrote a long reply, answering all the objections raised and giving further arguments in favor of the railroads. The report of the committee, to which the Board referred the memorial, was more unfavorable even than Livingston's letter. This report, which was sent to Stevens by Gouverneur Morris, asserted that the scheme for railways was wholly impracticable. The committee felt that a railroad could not be constructed of sufficient strength to bear the weight of the traffic which should be carried, and it was also thought that a railroad would be uneconomical from an operating standpoint.

Stevens made a detailed reply to the observations of the committee. The problem of comparative cost he disposed of briefly:

Were a canal to cost ten times as much as the proposed railways, if decidedly preferable, the difference of expense should by no means prevent its being carried into effect. And so, on the contrary, should the rail-ways be found most convenient and eligible, the difference in expense ought not to be regarded.

He was greatly disappointed with the action and attitude of the New York authorities, and he remained unshaken in his belief that the railroad was destined to become the chief highway of trade. He argued the matter no further, though he did resort to prophecy, his entire prediction escaping fulfillment by a narrow margin. He said:

But it would be useless to pursue the subject further. Should what has been already said be insufficient to open the eyes of the Committee, I have only to lament that their blindness on this occasion will certainly be followed by future regret. A discovery, more especially a physical one, when once made, and its development fairly exhibited before the public, can never, if of any importance, be lost or suppressed. Sooner or later, then, the improvement now proposed will be brought into general use, and, if I mistake not, long before the expected canal will be completed.

Failing to secure favorable action in New York, Stevens turned again to New Jersey, and on February 6, 1815, received from the legislature a charter authorizing the construction of a railroad between the Delaware River and the Raritan.¹ He could not get the

¹*Laws of New Jersey*, 39th Session, 2nd Sitting, Statute 68, 1815.

capital necessary to construct the proposed road, and the charter was permitted to lapse. His next effort was in Pennsylvania, where he urged the construction of a railroad between Philadelphia and Pittsburgh. In 1823 he obtained from the Pennsylvania legislature a charter for a road between Philadelphia and Columbia.¹ Stephen Girard was one of the incorporators, but he was apparently unwilling to do more than lend his name to the enterprise. There was no money forthcoming for the project, and construction was never started. The charter was repealed in 1826 when the legislature undertook the construction of the Main Line of the Pennsylvania Public Works.

So ended Stevens' fifteen years of effort to convince a sceptical public that the steam engine offered a means of solving the greatest economic problem of the United States. To satisfy himself that his views were correct, Stevens built a small circular track upon his estate in Hoboken, and on this track, in 1826, he ran a small locomotive of his own construction. This was the first steam locomotive built in American territory to operate on rails. But even this experiment seems to have had little more influence than the feat Evans had performed in 1804. Stevens was seventy-eight years old when he built the first American locomotive. He lived ten years longer, and witnessed the fulfillment of his prediction that steam railway transportation would come into use. Two of his sons, Robert Livingston and Edwin Augustus, took a leading part in the construction of the Camden and Amboy Railroad, the first railroad in New Jersey, the former being president of the company and the latter treasurer and general manager. The older son, Robert Livingston, made a trip to England to investigate railroads there, before beginning construction of the Camden and Amboy. While at sea he made a wooden model of the first T-rail, and while in England, ordered some iron rails made according to his model. He also ordered the locomotive, *John Bull*, from the Stephenson foundry. This locomotive was shipped to the United States in 1831, was operated for many years on the Camden and Amboy Railroad, and is now in the Smithsonian Institution at Washington. Edwin A. Stevens amassed a large fortune from his activities in railroad and other transportation enterprises. One of his public benefactions was the founding and endowment of Stevens Institute in Hoboken.

¹*Laws of Pennsylvania*, Chapter 148, 1823.

One other progressive American tried at an early date to induce Congress to appropriate money for experimenting with steam railroad transportation. This was Benjamin Dearborn of Boston. He presented a memorial to Congress in 1819, explaining with some detail the advantages of steam locomotives. His memorial was referred to the Committee on Commerce and Manufactures, of the House of Representatives, but no action was ever taken upon it.¹ Like Evans and Stevens, Dearborn was a few years in advance of his times.

Notwithstanding the failure of Evans and Stevens to accomplish results of a permanent nature, public interest in railroad transportation finally became active in the United States. Information concerning experimental work in England began to filter into this country, and references to English railroads made their appearance in American newspapers. In 1824 the Pennsylvania Society for the Promotion of Internal Improvements sent William Strickland to England to make a study of transportation facilities, and especially to investigate the work of steam locomotives. Strickland's report,² published in book form (51 pages with numerous plates) in 1826, attracted wide attention and was reprinted wholly or in part in several newspapers. Public meetings were held here and there to encourage the construction of railroads. The Mohawk and Hudson Railroad was chartered in 1826. The same year the Quincy tramway was built to convey stone for the Bunker Hill monument from a granite quarry in Quincy to the bank of the Neponset River. In 1827 the General Court of Massachusetts created the Board of Commissioners of Internal Improvements to survey routes for railroads from Boston to the boundary line of Rhode Island and to the New York boundary line near Albany. The Baltimore and Ohio Railroad Company was chartered, and work on this historic line begun on July 4, 1828. The Pennsylvania legislature decided in 1828 that two sections of the Main Line of Public Works—that between Philadelphia and Columbia and that across the Alleghanies—should consist of railroads. Horatio Allen, the engineer of the Delaware and Hudson Canal Company, went to England to study railroad operation, and bought four locomotives, one of which, the *Stourbridge Lion*, was tried out on the Carbondale and Honesdale

¹*Journal of House of Representatives*, 15th Congress, 2nd Session, p. 258.

²*Report on Canals, Railways, Roads and Other Subjects*, made to the Pennsylvania Society for the Promotion of Internal Improvements by Wm. Strickland, Architect and Engineer.

railroad in 1829 and later discarded because of its excessive weight. The Charleston and Hamburg Railroad was chartered in 1829. The directors engaged Allen as chief engineer, and determined from the beginning to employ steam as motive power, they ordered a locomotive from the West Point foundry in New York. Peter Cooper's little engine, the *Tom Thumb*, made its famous run on the Baltimore and Ohio Railroad in 1830, and convinced the directors of that line that steam power was better than horses. Illustrated descriptions of English railroads became numerous. Books written by English railroad authorities were imported and eagerly read. In 1830 Thomas Earle of Philadelphia, brought out his *Treatise on Rail-Roads and Internal Communications Compiled from the Latest and Best Authorities with Original Suggestions and Remarks*. An American printing of the second (1830) edition of Nicholas Wood's *Practical Treatise on Rail-Roads and Internal Communications*, was published by Carey and Lea of Philadelphia in 1832. The American editor, George W. Smith, added chapters describing the existing railroads of the United States, and giving a number of arguments tending to show the superiority of steam railroads over other means of transportation. The same year the *American Railroad Journal*, a weekly publication devoted to the promotion of railroad construction, was started in New York. Legislatures were flooded with applications for railroad charters, and construction was begun on a large number of lines. The development of the American railroad was fairly started.

Meanwhile the opposition to railroad construction was gathering strength. The "railroad mania" drew criticism from many sources.

The Railroad an Impracticable, Uneconomical, and Undesirable Means of Transportation

Even after initial experiments showed that railroad transportation was possible, there were many people who persisted in claiming that it was wholly impracticable, merely because they thought it "wouldn't work". Other antagonists of the railroads based their opposition upon the belief that canals and turnpikes afforded better means of transportation. In many cases the claimants of the superior advantages of canals and turnpikes had a financial interest in these facilities, and their opposition to the rival carrier merely

reflected their selfish interest, but there were at the same time many disinterested individuals who honestly believed that ordinary highways and artificial waterways would come out victorious in a competitive struggle with railroads.

The difficulties met with in convincing a legislature that a railroad might be useful were described by Gridley Bryant in his account of the building of the Quincy tramway. He said:

I had previous to the laying of the cornerstone (of the Bunker Hill monument) purchased a stone-quarry (the funds being furnished by Dr. John C. Warren) for the express purpose of procuring the granite for constructing the monument. The quarry was in Quincy, nearly four miles from water-carriage. This suggested to me the idea of a railroad (the Manchester and Liverpool Railroad being in contemplation at that time, but was not begun until the spring following): accordingly in the fall of eighteen hundred and twenty-five, I consulted Thomas H. Perkins, William Sullivan, Amos Lawrence, Isaac P. Davis and David Moody, all of Boston, in reference to it. These gentlemen though the project visionary and chimerical, but, being anxious to aid the Bunker Hill Monument, consented that I might see what could be done. I awaited the meeting of our legislature of 1825-26 (in the winter), and after every delay and obstruction that could be thrown in the way, I obtained a charter, although there was great opposition in the House. The questions were asked, "What do we know about railroads? Who ever heard of such a thing? Is it right to take the people's land for a project that no one knows anything about? We have corporations enough already." Such and similar objections were made, and various restrictions were imposed, but it was finally passed by a small majority only.¹

The second effort to secure the consent of the Massachusetts legislature to the construction of a railroad fared much worse than Bryant's effort. The Board of Commissioners of Internal Improvements, created in 1827, strongly recommended the building of a railroad from Boston to the Hudson River opposite the city of Albany. The recommendation was given long consideration by the legislature. Investigations of railroads were made, and one committee of the legislature traveled to Baltimore to inspect the Baltimore and Ohio Railroad. This Committee and other committees appointed to make a study of the question, were enthusiastically in favor of the proposed railroad across Massachusetts. A bill to incorporate a company to build the road, with the provision that the

¹Charles Francis Adams, *Canal and Railroad Enterprise of Boston*; in Winsor (Ed.) *Memorial History of Boston*, p. 117.

State should supply the funds for construction, was debated in the House of Representatives of the legislature in 1830. The *Boston Daily Advertiser*, published by Nathan Hale, an enthusiastic and ardent advocate of railroad construction, carried a good account of the debate. The opposition to the road was based on several grounds. Some legislators objected to the expenditure of public money for railroads, others opposed the line because it would help the commerce of Boston, at the expense of other cities and communities. There was, however, much opposition to railroads, as a matter of principle. One speaker opposed the whole project:

It was premature, it would cost an enormous sum of money, and would be worth little or nothing. He begged the House to pause, to have mercy on the people, to have some compassion. In the winter the snow would be in some places 10 feet deep, and so make the railroad useless. Taking into view the difference in the value of labour in England and in this country, the railroad would cost \$23,000,000. We might borrow this money for a time at 5 per cent, but when that time was out, we should have to pay 6 per cent. How would turkeys, butter and eggs look after coming over a railroad thirty miles an hour? How would pigs and passengers travel over it together in the same car? There was nothing else to bring. He called upon the House to wait before they began the work, till they saw a reasonable chance of getting their money's worth. If they must have a magnificent project, he would go the whole length, and would try to bring Heaven down to Earth, or Earth to Heaven.¹

A legislator from Salem wanted to experiment a little before committing the State to such a grand project. "He...wanted to see the operations of locomotives on a railroad, actually outstripping the winds in their progress, if the accounts from England were to be believed." The railroad was impracticable because the snow would interfere with its operation. Moreover there was but little traffic between Albany and Boston, and the price of transportation between those cities was already low.

. . . There would be too, always a reason for preferring the old roads, from the difficulty of shifting produce from one vehicle into another fit to operate on a railroad.

The idea of drawing away the trade of New York was fallacious. That was a great commercial emporium and it was true in trade as in physics, that greater bodies attract more than smaller. The rapidity with which we could travel and transport on a railroad

¹*Boston Daily Advertiser*, January 26, 1830.

was no object except where the article to be carried or transported was perishable. It might be an object so far as transporting fresh codfish was concerned but if we were to set about building a railroad to Albany, that would cost millions, that the people of that ancient city might enjoy the luxury of fresh codfish for breakfast, he should like to know it.¹

The bill finally came to a vote in the House on January 30 and was overwhelmingly defeated, 283 to 160. In an editorial in the *Daily Advertiser* of February 1st, Hale roundly condemned the action of the House. He called attention to the fact that during the three preceding years numerous investigations had been made by competent engineering authorities and by special committees of the legislature, and that without exception, the reports had favored the construction of the proposed improvement. He declared, "The natural impression, on the minds of those who know that the legislature has been for three years earnestly engaged in the investigation of this subject, will be, that the enterprise is abandoned, either because the House are incapable of appreciating one of the greatest improvements of modern times, or because the State is thought too poor to undertake it."

The members of the House of Representatives of the General Court of Massachusetts were not the only ones who failed to set a proper value upon "one of the greatest improvements of modern times." By the time the State of Pennsylvania completed the railroad between Philadelphia and Columbia, the steam locomotive had become a success, and the question arose as to whether steam power should be used on the new road. In 1833 and again in 1834 committees of the House of Representatives reported in favor of the use of steam,² and finally the legislature authorized the Board of Canal Commissioners to purchase a number of locomotives.³ The Board proceeded at once to order fifteen engines, and two of them, built by Matthias Baldwin of Philadelphia, were put into use in 1834.

The farmers living along the line of the new road for the most part looked with deep disfavor upon the use of steam locomotives. They desired that the railroad should be maintained as a public highway upon which they could use their own horses and

¹*Boston Daily Advertiser*, January 28th, 1830.

²*Journal of the 43rd House of Representatives*, Pennsylvania, Number 216, p. 718. Also *Journal of the 44th House of Representatives*, Number 169, p. 705.

³*Laws of Pennsylvania*, 1833-34, No. 231. *Laws of Pennsylvania*, 1834-35, No. 35.

wagons. They also disliked the locomotives because their flying sparks frequently set fire to buildings, forests and meadows. A large number of petitions reached the legislature from the farmers of Chester and Lancaster counties, asking that the use of locomotives be discontinued, and the railroad made a public highway for the use of everybody.¹ Losses by fire were frequently brought to the attention of the legislature. On February 13, 1835, Mr. Elijah F. Pennypacker "presented the petition of Joseph J. Downing, of Chester county, stating that his barn was destroyed by fire communicated from a locomotive engine passing upon the Columbia railway, and praying for compensation for loss."²

Opposition to railroads occasionally found expression in Congress. In 1836 it was proposed that the Cumberland Road, or at least a part of it, be converted into a railroad. Two powerful speeches were made in favor of such action in the House of Representatives, one by William Jackson of Massachusetts, and the other by T. Webster of Ohio. The opposition was strong enough to defeat the proposal. Several speeches were made against the change, but unfortunately the record does not preserve the remarks of the opponents of the railroad. The character of their views may be seen however, in the following extract from Jackson's speech.

And nothing is more surprising to me than the strange determination manifested by intelligent gentlemen of this floor, to throw dust into each other's eyes, in relation to this very important project. A railroad is a monopoly!—not so democratic! They are willing that gentlemen of wealth and aristocrats, should build railroads, and travel on them if they choose! But their constituents are all democratic republicans—plain men—and want a road on which they can all travel together; no toll, no monopoly, nothing exclusive—a real "people's road" . . .

The honorable gentleman from Indiana, (Lane) says, "What if a railroad is better?"—and intimates that if the people prefer a common road, it being for their use, gentlemen from other parts of the Union ought not to interfere in the matter.³

The problem of compensating railroads for the transportation of the mails received the attention of Congress at an early date, and in the course of the discussion of this subject there were many

¹Notice of such petitions in the *Journal of the 45th House of Representatives*, Pennsylvania, 1835, pp. 199, 268, 335, 360, 379, 399, 471, 493; and in the *Journal of the Senate*, Pennsylvania, 1835, pp. 301, 306, 317.

²*Journal of the 45th House of Representatives*, Pennsylvania, p. 368.

³*Register of Debates of Congress*, 1836, p. 4498.

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remarks about the efficiency of the new means of transportation. For the most part, members of Congress soon came to realize that the railroads afforded a means of transporting the mails superior to any means previously employed. Nevertheless there were numerous expressions of doubt. Senator Thomas H. Benton, "did not think they ought to surrender, so quickly, and agree that they could not get along with the business of the country without the aid of these railroad companies." He thought that with a proper organization of the service, the mails could be carried just as rapidly by horses as on the steam railroad.

He had understood that great delays, by which passengers were subject to much inconvenience, had occurred on one of these railroads—the railroad from Baltimore to Wheeling. He had been told by a gentleman who had recently traveled on that road, that the delays to which they had been subjected had been so vexatious that they had cause to regret that railroads had superseded the old mode of travel.¹

During the early days of the railroad there were many people who held firmly to the opinion that the turnpike afforded a faster and safer means of travel than the steam highway. Numerous pamphlets were published in England to show that the railroad would be of but little public benefit. The success of the *Rocket* on the Liverpool and Manchester Railroad did not convince the doubters that a new era in transportation was at hand. Alexander Gordon, a distinguished civil engineer, published several pamphlets to prove the superiority of the turnpike. One of his pamphlets, printed nine years after the first trip of the *Rocket*, bearing the title, *Observations Addressed to Those Interested in Either Rail-Ways or Turnpike Roads*, contains the following passages:

The prevailing mania for general edge rail-way communication must be viewed with no little anxiety by land-owners, road-trustees, inkeepers, post-masters, carriers, and by others interested in the existing lines of turnpike-road, and also by those who value this important branch of our inland intercourse, threatened, as "these good old ways" are, with extinction, by speculators in what, in the opinion of many, is still an untried system of rail-way intercourse. The proposers and supporters of the many rail-way schemes now before the public have taken for granted that it is by rail-ways *alone* that vast political, agricultural, and moral advantages are to result to this country; and I have often heard my own arguments reiter-

¹*Congressional Globe*, 24th Congress, 1st Session, 1836, p. 374.

ated as if they had been adduced to establish rail-way monopolies. . .

When looking at the recent introduction of edge rail-ways for purposes of general traffic, and at the proposed extension of such roads across the country in main and branch lines, I have for some years entertained and adhered to the following propositions:

1. *The mechanical advantage of an edge rail-way is small when compared with a good turnpike-road.*

2. *This advantage is too trifling to warrant the expenditure of the large capital requisite for attaining it.*

3. *In the event of rail-ways for general traffic being formed to the great leading towns, public and individual interest will be needlessly injured, however much, or however little, rail-way proprietors may benefit by them.*

4. *Turnpike-roads can be improved and made available for purposes of the most expeditious, safe and beneficial internal communication.*

After demonstrating (to his own satisfaction at least) the truth of each of these propositions, he concludes as follows:—

If the above observations be correct, wherein I have shown,—that the first assertions of the rail-way engineers as to the limited velocity of canal conveyance have been upset,—that according to the immutable laws of motion, the edge rail-way can merely reduce surface resistance,—that all the reduction of surface-resistance which can be effected by an edge rail-way, is not worth making, when the line is anywhere but on a dead level—that variations in level are absolutely necessary for the manufactures, trade, and population of the country, that surface-resistance can be reduced by other means than by rails,—that these other means would be more economical, permit of more traffic, and consequently furnish more toll-returns to the road-proprietors, that a system dangerous to the interests of the public, from its withdrawing repairs, travellers, and business from existing roads, from its being that of a monopoly destructive of freedom in the carrying trade, and unavoidably attended with much loss of life, could be obviated,—that the velocity of rail-way travelling may be attained by other means, means approved of by several of the most eminent engineers, although unknown to or not appreciated by rail-way engineers,—that agriculturists might have conveyance much more for their interests than rail-ways, from their exclusive nature, can ever be,—and that the expenditure of forty millions of pounds proposed for rail-ways would prevent of the supply of necessary funds for more approved systems of intercourse;—if there be any advantage in having roads of the country PUBLIC property, and not at the mercy of companies of private speculators,—if the convenience of

the public be better provided for by a more general system of locomotion, and by the number of times of starting without waiting for the filling of a long rail-way train;—if the boasted excellence of the rail-way system for military purposes be upset by certain death which the disaffected might spread merely by shifting one rail, or by placing a stone upon the road;—my readers will approve of an affirmation which I formerly made, “that a short time will see the general edge rail-way system deprecated, as commercially, agriculturally, and politically hurtful,”—and conclude with me, that turnpike-roads may be so much improved, that every branch of the carrying trade may be conducted thereon, at much more moderate prices than now charged,—and that, above all, the benefits resulting from expeditious locomotion may be obtained on the same public roads.

It did not take long for the fast steam passenger train to prove its superiority to the stage-coach, and wherever railroads were built parallel to turnpikes, travelers adopted the new means of conveyance, and the stage lines were abandoned because of lack of patronage. There were some people, however, who did not admire the change. They sincerely regretted the passing of the old ways of travel. The greater speed of the steam trains did not compensate for their disadvantages. One traveler, Samuel Breck, thus recorded his opinions of railroad travel:

July 22, 1835.—This morning at nine o'clock I took passage in a railroad car (from Boston) for Providence. Five or six other cars were attached to the locomotive, and uglier boxes I do not wish to travel in. They were huge carriages made to stow away some thirty human beings, who sit cheek by jowl as best they can. Two poor fellows, who were not much in the habit of making their toilet, squeezed me into a corner, while the hot sun drew from their garments a villainous compound of smells made up of salt fish, tar and molasses. By and by, just twelve—only twelve—bouncing factory girls were introduced, who were going on a party of pleasure to Newport. “Make room for the ladies,” bawled the superintendent. “Come, gentlemen, jump up on the top; plenty of room there.” “I’m afraid of the bridge knocking my brains out,” said a passenger. Some made one excuse and some another. For my part, I flatly told him that since I belonged to the corps of Silver Grays I had lost my gallantry, and did not intend to move. The whole twelve, were, however, introduced, and soon made themselves at home, sucking lemons and eating green apples. There is certainly a growing neglect of manners and insubordination to laws, a democratic familiarity and a tendency to level all distinctions. The rich and the poor, the educated and the ignorant, the polite and the vulgar, all herd together, in this modern improvement in travelling.

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The consequent result is a complete amalgamation. Master and servant sleep heads and points on the cabin floor of the steamer, feed at the same table, sit in each other's laps, as it were, in the cars; and all this for the sake of doing very uncomfortably in two days what would be done delightfully in eight or ten. Shall we be much longer kept in this toilsome fashion of hurrying, hurrying, from starting (those who can afford it) on a journey with our own horses, and moving slowly, surely and profitably through the country, with the power of enjoying its beauty and be the means of creating good inns? Undoubtedly, a line of post-horses and post-chaises would long ago have been established along our great roads had not steam monopolized everything. Steam, so useful in many respects, interferes with the comfort of travelling, destroys every salutary distinction in society, and overturns by its whirling power the once rational, gentlemanly and safe mode of getting along on a journey. Talk of ladies on board a steamboat or railroad car! There are none. I never feel like a gentleman there, and I cannot perceive a semblance of gentility in any one who makes part of a travelling mob. When I see women who in their drawing rooms or elsewhere I have been accustomed to respect and treat with every suitable deference—when I see them, I say, elbowing their way through a crowd of dirty emigrants or low-bred, home-spun fellows in petticoats or breeches in our country, in order to reach a table spread for a hundred or more, I lose sight of their pretensions to gentility and view them as belonging to the plebeian herd. To restore herself to her caste, let a lady move in select company at five miles an hour, and take her meals in comfort at a good inn, where she may dine decently.¹

Unlike some members of Congress, who held the railroad in contempt as being designed for the use of aristocrats, Mr. Breck was depressed by the aspect of democracy which every railroad carriage and steamboat presented to his view. In England the railroad managers endeavored to preserve social distinctions by affording different "classes" of service, but in the United States the spirit of equality forbade such attempts at discrimination. Continued experience with railroads did not soften Mr. Breck's attitude. Four years after he wrote the opinion quoted above, he made the following comment:

December 31, 1839.—The modern fashion in all things is "to go ahead", push on, keep moving, and the faster the better—never mind comfort or security or pleasure. Dash away, annihilate space by springing at a single jump, as it were, from town to town, whether you have pressing business or not.

¹*Recollections of Samuel Breck*, pp. 275-76.

Another traveler of the early days of the railroad left in his diary an interesting comparison of the three common methods of conveyance. John Parsons, a young Virginian, started from his home in Petersburg in 1840, to make a tour through the "West". From Petersburg to Richmond, and from Richmond to Fredericksburg, he went by "railroad train". His impression was not a favorable one:

It was therefore, with a sensation of pleasure that I left the railroad at Fredericksburg to enter the stage coach which was to take me the nine hilly miles to Potomac Creek, where I found the steamboat. This last is a most excellent method of travel when the boat is, as this was, spacious, rapid and very clean.²

¹*Recollections of Samuel Breck*, p. 277.

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following the introduction of the railroad, such events as the one described in the following paragraph were not uncommon:

Last Wednesday, four superb Stage Coaches, each drawn by six noble horses, passed through town, on their way to Columbus, Ohio. They were from Worcester and were formerly running between that town and Boston, and also on the Norwich road, both of which are rendered comparatively useless for Stages in consequence of the Railroads.¹

The debate over the relative merits of railroads and canals as carriers of freight was not settled so easily and so quickly as the argument about the advantages of railroads and turnpikes. Railroad construction began in the United States just at the time that canal transportation had achieved a high degree of popularity. The Erie Canal, completed in 1825, proved to be a highway of immense value, and other States, stimulated to action by the success of the New York enterprise, began to plan and execute extensive programs of canal construction. In a number of cases, railroads were projected to run parallel to canals, and a controversy at once arose as to which of the two means of conveyance would have the advantage in competition for traffic. It was soon generally conceded that the railroad would be superior to the canal for the transportation of passengers; but the advocates of canal construction were far from admitting that the railroad would achieve any substantial measure of success as a carrier of freight.

A heated controversy on the subject of railroads and canals arose between the adherents of the Chesapeake and Ohio Canal and of the Baltimore and Ohio Railroad. Both these improvements were projected for the purpose of connecting the waters of the Chesapeake Bay with the Ohio River. They were started on the same day, July 4, 1828, President John Quincy Adams officiating at the celebration which marked the beginning of the canal, and Charles Carroll of Carrollton, the last surviving signer of the Declaration of Independence, being the central figure of the imposing rival ceremony at Baltimore. The people of Baltimore naturally looked with favor upon railroads, while the citizens of Washington regarded railroads with scorn, and placed their faith unreservedly in canals. The newspapers of the rival cities took up the debate.

¹*Hazard's United States Commercial and Statistical Register*, December 25, 1839. (Quoted from the Northampton (Mass.) *Courier*).

The *National Intelligencer* of Washington was an ardent defender of artificial waterways:

We have with surprise seen it remarked, lately, in a highly respectable paper in Virginia, and repeated elsewhere, that the impression is becoming universal, that Rail-Roads, for the purpose of transportation, will altogether supersede canals. We suppose the impression prevails to a considerable extent, or we should not have found it in this form. In whatever form we have found it, or may hereafter find it, we cannot but consider it erroneous and fallacious.

A Rail-Road, for distant transportation, is an *experiment* wholly untried in any country, and but lately begun, in the instance of the Baltimore Rail-Road. The longest Rail-Road ever constructed before, or begun to be constructed, is the Manchester and Liverpool Rail-Road in England, the length of which is 35, or at most, 40 miles. And where is this Rail-Road situated? It is the conduit from the great and unequalled Manufacturing town of Manchester, to the greatest seaport of England, whence the manufactures of this and other towns are exported to all of the world. It is also connected with the great Manufacturing towns of Sheffield, Leeds, etc., and countless villages and factories. It passes over a comparatively level ground, through a community dotted with villages, and a redundant and prosperous population. There is not a half mile in the whole distance, perhaps, within which might not be found assistance and facilities to repair accidents, of any description, occurring to the cars, wagons, and steam engines. The goods to be transported on it are of great value and small bulk. *This* Rail-Road, nevertheless, supported by all the wealth of the merchants and Manufacturers of those towns, has had great difficulties to struggle with. The Rail-Road begun at Baltimore in our vicinity, has to struggle against obstacles from which, as we have seen, the English Rail-Road is comparatively free, and is to be ten times in length or nearly. If we know ourselves we have no unfriendly feeling to that undertaking. We shall be glad, indeed, to see it, in good time, reach its destination, but the idea of its successfully competing with a canal of the same length, over a rough and comparatively wild country, passes the bounds of probability. . . .

Let our friends elsewhere pursue their Rail-Roads; but let us also hold to our canal, which is to be the channel of the wealth of the West, and the source of almost inconceivable prosperity, not to us, perhaps, who are now on the stage of life, but certainly to the District of Columbia—we hope, also, to our sister Baltimore, who, either by her Rail-Road, or by a lateral canal, will doubtless obtain her share of the vast commerce which will be carried on, in no long

time to come, between the West and the East, through the tunnel of the Alleghany.¹

The editor of the Baltimore *American* made a spirited reply to the observations of the *National Intelligencer*, calling attention to the great advantages which would result from the use of the steam locomotive on the Baltimore and Ohio Railroad. The *National Intelligencer* made prompt response:

But this fact has no bearing whatever on the question between Rail-Roads and Canals. Whatever can be effected on a Rail-Road by Steam power, can, beyond doubt, be effected with double facility on a canal; not perhaps with the same velocity, but with certainly and economy.

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For this day we will only suggest one advantage of a canal, not heretofore adverted to, which is wholly denied to a Rail-Road. On a canal, the farmer in Ohio or Western Pennsylvania, or Maryland, or Virginia, may, in a leisure time, hitch his wagon horses to a boat, built from his own timber, loaded with the produce of his own farm, and travel down the tow path with his whole year's crop (and his neighbor's besides), on one bottom, and return back in the same way, loaded with whatever pleases him in the market. On a Rail-Road (admitting its practicability) he must commit it to cars and "locomotive" machines, and keep what company he can with it, if he can find the money to bear its expense to market, and get back in the same way, the expense of going and coming consuming half the value of his freight. He cannot put his wagon on the Rail-Road, nor can he drive his cattle and hogs upon it.²

Not all the stockholders of the Chesapeake and Ohio Canal Company shared the confidence felt by the editor of the *Intelligencer* in the future prosperity of the waterway. One stockholder, apparently convinced of the truth of the prediction that railroads would eventually supersede canals, wrote a letter to the *United States Telegraph*, expressing the hope that the prosecution of the canal would be discontinued and a railroad built in its place.³ This letter drew a prompt reply from a canal advocate, who in a letter to the *Intelligencer*, endeavored to quiet the fears of the doubting stockholder.

An engineer of high standing in Liverpool, who is in constant correspondence with a gentleman of this city, known as an

¹*National Intelligencer*, January 30, 1830.

²*Ibid.*, February 4, 1830.

³*United States Telegraph*, February 6, 1830.

advocate of Rail-Roads, uses language to this effect in some of his recent letters, which have been read to me: But let me advise you by all means to avoid embarking on these expensive rail-ways until you have seen the effect of them on this side of the water; there is much, very much, yet to learn on the subject, it is the hobby at present, and one which is ridden unmercifully. One good effect, however, arises from it—it scatters overgrown fortunes, and gives employment to the poor.

With these extracts I will stop, in the constant hope, that they may serve to lessen the *Rail-Road mania* which appears to be making at this time such fearful strides.¹

To a statement appearing in the *Baltimore Gazette*, claiming that railroads would be greatly superior to canals because freezing weather would not prevent railroad operation, the editor of the *Intelligencer* made this response:

The editor of the *Baltimore Gazette* urges upon us, as an argument against canals, in this comparison, that they are subject to be closed by ice, from the effects of which Rail-Roads are exempt. This is a fair argument as far as it goes, but it is outweighed all to nothing, by the advantages of Canals for every purpose of an agricultural country. In return, we suggest to him, that a fall of snow will make a Rail-Road three hundred miles long impassable, sometimes for weeks, without the warning of impending ice, which the almanac affords, when it marks the advent of Christmas Day; and that heavy floods in the summer season will wash earth over them in quantities, which (as in deep cuts) it may take weeks, if not months, to remove. A single slide of earth in one of these deep cuts, will obstruct a Rail-Road more than a Winter's ice will a canal. We do not make these objections to Rail-Roads, any more than our friend in Baltimore makes ice in canals: we are sorry that they exist. But when an account is settled, we must look at the debtor as well as the creditor side, before the balance is struck.²

Another letter published in the *Intelligencer* showed a slightly different form of argument against railroads. It was signed "A Plain Man":

Rail-Roads are very artificial things.

When you have once dug the ditch or trench for the canal and let in the water, you have a natural agent on which your boat is floated, as on a river.

But rails, whether of iron or wood, on which your merchandise is to be carried, are things of art altogether. The vehicles above

¹*National Intelligencer*, February 13, 1830.

²*Ibid.*

Simple

all the one that contains the propeller engine, whether fixed or stationary, which puts the whole in motion, are complicated contrivances of art. Compared to a common canal boat the latter has the advantage of fifty to one in simplicity.

Many a farmer is able to build a boat on his own land, that would do for a canal: but how many could make a locomotive carriage and engine like the "Novelty", for instance or the "Rocket", or manage such things along a Rail-Road after they are made?

Being altogether things of art, Rail-Roads are only suited to countries highly advanced.

They are seen only in the most populous and wealthy parts of such countries.

It is further remarkable, that they have only been found to answer for short distances, even in such parts of such countries.¹

A spring freshet that temporarily submerged a part of the Baltimore and Ohio Railroad gave the editor of the *Intelligencer* an opportunity for the following facetious comment:

The latest good thing that we have seen is the recommendation of the Baltimore *American*, of yesterday's date to the Chesapeake and Ohio Canal Company to turn their canal into a Rail-Road! The gravity with which this waggery is carried on adds mightily to the zest of it. We had like to have fallen into the same error as regards to it as some people do occasionally with our jokes—that is to take them seriously. The last report we had from the Rail-Road was, that it was becoming a canal, at least in parts of it, without waiting for the conversion of the company from the error of their ways. That it will be converted into a canal, in the end, we have no more doubt that we have in the entire and triumphant success of our canal.²

The Federal Government purchased a large block of stock in the Chesapeake and Ohio Canal Company, and the legislatures of Maryland and Virginia also bore a share of the expense of constructing the canal. The Baltimore and Ohio Railroad was fortunate in being able to secure financial assistance from the city of Baltimore. Both companies were anxious to secure further appropriations of public funds. At an early date in the history of the two enterprises the rival corporations became engaged in an exceedingly bitter legal contest over the right of way through the narrow part of the Potomac Valley extending from the Point of Rocks to Harper's Ferry. The dispute about the right of way and the appeals for financial aid provided the occasion for an exhaustive

¹*National Intelligencer*, March 4, 1830.

²*Ibid.*, April 13, 1830.

investigation of the relative merits of canals and railroads, in the course of which both sides presented all the arguments they could gather in favor of their respective projects.

In 1831 the Committee on Internal Improvements of the House of Delegates of the Maryland legislature requested the officials of the two companies to submit reports which would enlighten the Committee as to the "relative expense, benefits, and facilities of constructing railroads and canals, with a view to ascertaining to which of these means the funds of the State can be more beneficially applied." Both corporations submitted the desired reports. The report of the railroad company maintained, among other things, that canals were much more expensive to construct than railroads, estimating the cost of a canal to be probably fifty per cent. greater than the cost of a railroad, both built under substantially similar conditions.¹

The third annual report of the President and Directors of the canal company contained a sharp criticism of the estimates prepared by the railroad company. A copy of this annual report, with a large number of letters and other documents designed to show the superiority of canals over railroads, was submitted to Congress by the President of the canal company in December 1831, appended to a memorial asking additional financial assistance from the Federal Treasury.²

Among the letters submitted was one from Josiah White, Acting Manager of the Lehigh Coal and Navigation Company. A part of his letter ran as follows:

Railroads are a great improvement over turnpikes; but, in my opinion, are vastly inferior (particularly as a public work, and in a republican country) to canals, both as to convenience as well as to economy. A canal is accessible anywhere, a railroad nowhere (without interrupting the current of traffic) except by an arrangement for turning out; and the more turn outs are made, the greater the casualties. By canal every boatman may choose his own motion, within the maximum motion; by railroad every traveller must have the same motion, or be subject to turn outs; which, as I have said, have their casualties. The motion of twenty or thirty miles an hour on railroads will be fatal to wagons, road and loading, as well as to human life. . . .

¹The report of the railroad company to the Committee of the House of Delegates may be found in *House Document Number 101*, 22nd Congress, 1st Session, pp. 201-207.

²*House Document Number 18*, 22nd Congress, 1st Session (1831-32).

I think it rather fortunate for society, that railroads are not of equal value to canals, for a railroad can be taken anywhere; and, consequently, no improvements would be safe on their line; for the moment the improvement succeeded, it would be rivaled, so as to destroy both, &c., whereas we know the line and limit of our canals, by the supply of water and the graduation of the ground; so that all improvements thereon are safe against the undermining of rivals. I should consider, that, if the railroads superseded canals, they would, for the above reasons, render the tenure or value of property as insecure as it would be without the protection of the law.¹

Benjamin Wright, the famous New York engineer, who had surveyed the route for the Erie Canal in 1811-12 and later superintended the construction of the middle section of that waterway, also gave testimony in favor of canals, in a letter to the President of the Chesapeake and Ohio Company. Wright later became chief engineer of the canal. He said in part:

You ask me my opinion of the comparative advantages of canals and railroads, as applied to the Potomac Valley, and the great plan of connection between the eastern and western waters?

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I am decidedly in favor of a canal in preference to a railroad, and more particularly for that part between tidewater and Cumberland, and between Pittsburg and the mouth of Casselman's river. . .

I am probably, at this time, in a minority in the United States as to my opinion of the comparative advantages between canals and railroads. I have very little doubt that I shall be in the majority before two years more are expired. . . .

I admit that, for passengers, a railroad is a useful and rapid conveyance, but in our country, and particularly in the Potomac valley, the passengers are a small matter compared with the products of the soil and the forests and mines. . . .

But that great advantage a canal will always have over a railroad consists in the little mind, or thought, that is required to use it. Any man or boy can navigate a canal, but it requires much more mechanical skill to manage a railroad even by horse power, and many times as much more, to manage a locomotive. I consider a long line of railroad, when the power is often changed, as it necessarily must be, in passing from Baltimore over the mountains, as a very complicated machine; as liable to have its parts get out of order, at a distance from any work shop, where repairs can be made; and as being odious in this country, as a monopoly of carrying, which it necessarily must be. A canal, on the contrary, is open to any who builds a boat, and he may travel or stop, where or how he pleases, if he does not interrupt the passing of others.

¹House Document Number 18, 22nd Congress, 1st Session, pp. 171-72.

In short I place a railroad between a good turnpike and a canal I consider the expense of transportation, from the little experience I have had, to be about in the proportion of three to one, as between a canal and a railroad, in favor of the former, without tolls on either. All these opinions are the conclusions of my own mind, from critical examinations of works of both kinds.¹

An extract from the annual report of the Pennsylvania Canal Commissioners of 1831, gave support to the contentions of the Chesapeake and Ohio Canal Company:

While the board avow themselves favorable to railroads wherever it is impracticable to construct canals, or under some peculiar circumstances, yet they cannot forbear expressing the opinion, that the advocates of railroads generally, have greatly over-rated their comparative value.²

The advantages of canals were summed up as follows:

1st. That the actual cost of any canal or railroad must depend on the plan adopted for each work, and the character of the ground over which it is conducted, both as to the quality of its soil or materials, and the regularity or inclination, of its surface.

2nd. That the prime cost of the best constructed railroad, of two tracks only, passing over the most favorable ground, must ever greatly exceed the prime cost of the best constructed canal, of ordinary dimensions, passing over ground equally favorable for this species of conveyance.

3rd. That the best constructed railroads, of two tracks, in Europe or America, and there are none, in either country, as yet, with more than two, exceed in their original cost, the best constructed canals in America, of ordinary dimensions.

4th. That the Baltimore and Ohio Railroad Company, as acknowledged by the last annual report of its President and Directors, to be imperfectly made for two-thirds of its extent below the Point of Rocks, and having but two tracks, will cost, per mile, nearly or quite as much, and if its obvious defects are hereafter supplied, probably more than the Chesapeake and Ohio canal, which, when done, will be the largest in the world; and in construction, inferior to none.

5th. That the actual cost of transportation for commodities, on the only railroad in England, of two tracks, on stone sills, and fitted for the exchange of commodities between its extremes, exceeds the actual cost of transportation on any of the canals of ordinary dimensions in the United States in the ratio of near or quite three to one, and this, whether the propelling power be animal labor or steam.

¹*House Document Number 18, 22nd Congress, 1st Session, pp. 173-175.*

²*Ibid.*, p. 177.

6th. That the cost of transportation on the first and best constructed division of the Baltimore and Ohio railroad, a division which has cost \$60,000 a mile, has not been reported by the President and Directors of that company, but probably exceeds the cost of transportation on the Liverpool and Manchester railroad, and is thrice as great as the cost of transportation on the Chesapeake and Ohio canal.

7th. That the relative cost of keeping up, by annual repairs, the fixed capital vested in the construction of railroads, and their necessary appurtenances, and of canals, has not been as yet determined by actual experience for a series of years; but must prove to be greatly in favor of canals so constructed as to have no perishable structures about them, except the wood of the lock gates, and certain parts of the houses of their attendants.

8th. And hence it follows, that where great velocity is not required for the transportation of the commodities of a country, as in one, the chief commerce of which consists of the rude production of its forests, mines and agriculture, canals furnish a much more valuable channel of trade, than railroads.

9th. But if rapid motion be desired, such have been the late discoveries made in propelling passage boats on the canal in Scotland, that a rational and well grounded hope may be indulged, of approximating the speed of travelling on canals very near to the useful or practical velocity on the best constructed railroads of two or more tracks.

10th. There will remain, then, to counterbalance all these considerations in favor of canals having an adequate supply of water but one advantage in favor of railroads of any number of tracks, that of being unobstructed by ice during that part of each winter in which the canal may be frozen so deep as to be innavigable. Many winters, as far north as the valley of the Potomac, like that of 1827 and 1828, afford no ice, at any time, of the thickness of three inches. None are so intensely severe as to pass without occasional thaws. . .

11th. To counterbalance this disadvantage, snow in winter, and dust in summer, will be more injurious to railroads than canals. A remedy for the last cause is purchased, as we have seen, on the Liverpool and Manchester railroad, at a heavy cost of labor. In a thinly peopled country, in passing successive ranges of inaccessible as well as lofty mountains, beneath precipices of rocks extending for miles together, the removal of drifts of snow, in winter, would be attended with still greater expense, and in snow storms or ice sleets of many hours or several days' duration, would be nearly impracticable.

12th. The freezing of the water in a canal, is then the sole consideration, operating in the comparison unsettled between canals and railroads, to the prejudice of the former.¹

¹House Document Number 18, 22nd Congress, 1st Session, pp. 221-222.

The memorial of the canal company with its accompanying documents came, in due time, to the notice of the president of the Baltimore and Ohio, who transmitted it to the chief engineer of the railroad, Jonathan Knight, with instructions to prepare a reply, dealing with the mechanical efficiency of the railroad, its cost of construction, and its cost of operation. The engineer made an able defence of the railroad, reiterating all the claims which had previously been made in the report to the House of Delegates of the Maryland legislature, and replying to the criticisms which the president of the canal company had directed at that report. One statement made by the railroad advocate was of particular significance:

We see no cause to change our opinions, as then expressed with regard to the relative merits of canals and railways. Public opinion and public interest will settle the question in due time, and we rest assured, that, at the same time that it is the tribunal of the last resort, the decision will be just.¹

The controversy between the adherents of the Baltimore and Ohio Railroad and of the Chesapeake and Ohio Canal was repeated in New York between the friends of the State waterways and the promoters of the early New York railroads, though the debate in New York did not give rise to such voluminous documentary testimony as the Potomac Valley affair. Benjamin Wright, the New York engineer, who displayed such a decided preference for canal transportation in the Potomac Valley, was appointed by the Governor of New York, in 1834, to undertake a survey of the route of the proposed New York and Erie Railroad, which had been chartered in 1832. The legislature was contemplating advancing a large sum of money for the construction of this road, and there was a demand for expert opinion as to the feasibility of the project. Judge Wright completed the survey in December, 1834, and in his report strongly recommended the construction of the railroad.

In the first annual report of the president and directors of the New York and Erie Railroad, the following statement appears:

No sooner, however, was the report of Judge Wright presented to the legislature, showing the feasibility of completing, at moderate expense, the desired channel of intercourse through the southern section of the State, than a combination of local interests, singularly violent in character, was arrayed to defeat the enterprise. The most active and determined exertions were made, openly by some, and cov-

¹*House Document Number 101, 22nd Congress, 1st Session, p. 174.*

erty by others, to prejudice the public mind, and discourage if possible, the friends of the undertaking. The object was denounced as chimerical, impracticable and useless. Anonymous writers were employed to pronounce the survey inaccurate and deceptive, and the estimates unsafe and fallacious. The road, it was declared, could never be made,—and if made, could never be used. The southern counties were asserted to be mountainous, sterile, and worthless, affording no products requiring a road to market,—or if they did, that they ought to resort to the valley of the Mohawk, as their natural outlet. The whole enterprise, supported as it was, by great masses of the population of the state, was pronounced to be a mere scheme of stock jobbing, and stigmatized as an attempt to deceive the southern counties—defraud the public—and ruin the individuals who might embark in it.

Among the anonymous writers who joined in the condemnation of the proposed railroad there was one man who was so unkind as to call attention to the letter which Judge Wright had written three years previously to the President of the Chesapeake and Ohio Canal Company in defence of canal transportation. He condemned the engineer's report as misleading and inaccurate, and quoted the entire letter.¹

The controversy over the relative merits of canals and railroads received at an early date the official attention of the New York legislature. By a resolution adopted February 23, 1835, the Assembly directed the Canal Commissioners of the State to submit "a statement showing the average relative cost per mile of canals and railroads, the average relative expense annually of repairs and superintendence, and the average relative charges per ton, or other given quantity for transportation. . . ."

The Canal Commissioners immediately called to their aid three of the engineers employed on the canal system, "John B. Jervis, Holmes Hutchinson, and Frederick C. Mills, Esqs., civil engineers, of experience in the construction of canals and railroads." These three men drew up a report, based upon their personal experience and upon printed information then available concerning the advantages claimed for railroads and canals. This report the Commissioners submitted to the Assembly, with some comments of their own. The Commissioners said in part:

The subject submitted to the consideration of the Commissioners, is interesting in its character, and of some public importance. The

¹ In a pamphlet of eleven pages entitled *The New York and Erie Railroad*, and signed "A Taxpayer."

comparative cost of constructing railroads and canals, the comparative cost of transportation, and the comparative expense of superintendence and repairs, are subjects which have occupied a large share of public attention; and respecting which, many speculative opinions have been advanced. At one period, the public were assured with some degree of apparent confidence, that rail-roads would supersede canals; and it will no doubt, be recollected by many, that inquiries were made as to the possibility of converting the Erie Canal into a rail-road.

Experience has gradually developed the relative utility of canals and rail-roads for the transportation of property. We think the period is not distant, if it has not already arrived, when the superior advantages of a canal over a rail-road, as a means of conveying property, will be indisputably demonstrated.

The report of the three engineers amply justified this statement. The engineers showed that "canals, on the average, have thus far, cost less than railroads, both in their construction and repairs." They found the "relative cost of conveyance" to be "a little over four and one-third to one, in favor of canals" and submitted numerous tables to prove their assertion. Their final word was as follows:

We are therefore led to the conclusion, that in regard to the cost of construction and maintenance, and also in reference to the expense of conveyance at moderate velocities, canals are clearly the most advantageous means of communication. On the other hand, where high velocities are required, as for the conveyance of passengers, and under some circumstances of competition, for light goods of great value, in proportion to their weight, the preference would be given to a rail-road.

It may be observed in favor of rail-roads, that they admit of advantageous use in districts where canals, for want of water, would be impracticable. This advantage often occurs in mining districts, and sometimes for general trade, where it is necessary to cross dividing ridges, at a level too high to obtain water for their summits.

The facts and reasonings presented, we believe clearly show, that both canals and rail-roads are highly important means of internal communication, that each has its peculiar advantages, and will predominate, according to the character of the route, and the trade for which it is intended to provide.¹

So the controversy went on, each side claiming a preponderance of the evidence. The official record published by legislative bodies contains all the arguments of importance, though scores of articles written in favor of the rival improvements appeared in newspapers

¹*New York Assembly Document Number 296, 58th Session, 1835.*

and periodicals.¹ The *American Railroad Journal* frequently published long communications both from the friends of canals and from the supporters of railroads. But as the Quaker engineer of the Baltimore and Ohio Railroad stated, it was "public opinion and public interest" which finally settled the question, and not the closely reasoned statements of the opposing advocates.

Opposition of Vested Interests

While the advocates of canals and turnpikes appeared for a time to have an unbounded confidence in the superiority of these two agencies over the upstart railroad, there was no disposition on the part of canal and turnpike owners to welcome a competitive struggle with the new improvement. They soon gave evidence of fear of the outcome of such a struggle by opposing vigorously the granting of railroad charters by state legislatures.

In England the opposition to the construction of railroads was stronger even than in the United States, because the vested interests which feared railroad competition were much more powerful. One of the heaviest items of expense of the early English railroads was the cost of getting bills for charters through Parliament. Money was spent freely to employ the most skillful lawyers to defend various projects before Parliamentary committees. The "Parliamentary and law expenditures" of the Liverpool and Manchester Railroad amounted to nearly thirty thousand pounds. Most of this sum was spent to overcome the enemies of the enterprise. One reason for the comparatively high capitalization of British railroads was the large expense of obtaining charters. One English writer thus described the early difficulties of the railroad companies:

The obstructionist tactics that had previously been directed against stage coaches and canals were now levelled at the innovation which was largely to supersede both. Many towns petitioned against having the railways brought near them, and demanded that railways and canals alike should be kept several miles from their borders. The vested interests of stage-coach proprietors and carriers offered strenuous opposition to the new system. The medical faculty were pressed into the service of the opposition, with direful forebodings of the physical evils that would follow from travelling at the rate of from thirty to forty miles an hour. Country

¹A good example of articles dealing with the comparative value of canals and railroads appeared serially in Hazard's *Register of Pennsylvania*, Vol. VII, pp. 190, 194, 218 (1831). The article was reprinted from the *Albany Evening Journal*.

squires set up a howl as to the devastation that railways would work on their fox-covers. Territorial magnates joined in the crusade, on the ground that sparks from the locomotives would fire their plantations and destroy the amenities of their demesnes. Canal proprietors urged that they had already provided all the facilities necessary for heavy traffic, and that it would be grossly unjust to allow a rival interest to step in and deprive them of the fruits of their efforts and expenditure. In some cases railway companies were forbidden to use any "locomotive or movable engine" without the consent of the owners and occupiers of the lands through which their line passed. Railway engineers and surveyors were not permitted to carry out their surveys without resorting to either force or strategy. Large sums of money were extorted for the purpose of buying off opposition.¹

The turnpike companies, stage lines, wagoners and innkeepers, were the first to feel the full effect of railroad competition in the United States. They made a determined, but for the most part, an ineffectual resistance. Col. A. K. McClure described the struggle in Pennsylvania:

It is difficult for our people in this progressive age to understand the desperate resistance made by the people generally throughout the state to the introduction of railroads. When Pennsylvania at an early age had given liberal assistance to the construction of turnpikes, making continuous lines from Baltimore and Philadelphia to Pittsburgh, it was accepted that our commonwealth was in the very front of progress, and our turnpikes developed an immense industry in what was known as Conestoga wagons. Hundreds of six-horse teams, with immense covered wagons, were constantly on the highways, as they transported commerce and trade between the East and the West, and they created what formed a very powerful political factor in opposing the introduction of railways in the "wagon tavern."

Every few miles along our through turnpikes was found a wagon tavern. There was one or more in every village, and well-to-do farmers whose homes were on the turnpikes ran the wagon taverns as a side industry. All of them had capacious yards about the barn to accommodate teams during the night. Excepting in extremely inclement weather the horses always stood out attached to the wagons. Hay and oats were furnished for the horses at very moderate prices, and the driver could obtain a "snack" or cold lunch in the evening, a bed, a hot breakfast and an evening and morning drink of whisky for twenty-five cents.

The proprietors of the wagon taverns were generally men of influence in the community and when the proposition to construct

¹J. S. Jeans, *Railway Problems*, pp. 6-7.

railways was seriously urged, the wagon drivers and wagon tavern keepers made a most aggressive battle.

★ Mass meetings were held along the lines of the turnpikes to protest against the introduction of railways, which were declared to be of doubtful utility and which could be successful only by the destruction of one of the most important industrial interests of the state, that had immense sums of money invested and which would certainly be destroyed. Political orators, always ready to cater to popular prejudice, delivered most fervent harangues against the proposed injustice of bringing ruin to the great industrial "interests," which centered in wagon transportation. In some instances senators and representatives were elected solely on that issue.

Fortunately the progress of the railroad was so gradual that there was no violent destruction of the wagon transportation interests and the grand old Conestoga wagon, with its teams of six magnificent horses, usually elegantly caparisoned, gradually perished in Pennsylvania.¹

In 1831 a petition was presented to the New York legislature, signed by several residents of the towns of Brooklyn and Jamaica, Long Island, requesting a charter for a railroad "from the village of Brooklyn in the county of Kings, to Jamaica in the county of Queens, a distance of about twelve miles." At the same time the legislature received a remonstrance from other citizens of these two towns, asking that the petition for the charter be denied. The owners of the turnpike between Brooklyn and Jamaica likewise protested against the granting of the charter. The committee of the Senate, to which the petition and the remonstrance were referred, recommended that no charter be granted, saying in its report:—

To the prayer of this petition, objections are stated in the remonstrance, showing that from local circumstances connected with the enterprise, the large amount of damages which would be unavoidable, and the great extent of investments required, when compared with the limited business of this section of the country, and the inconvenience and injuries which would be imposed upon the inhabitants, renders the measure not only injurious to the country through which it must pass, but must produce results unfortunate to the interests of the stockholders.

The number and standing of the petitioners certainly entitle them to the most respectful consideration, but at the same time, the names on the remonstrance are still more numerous, and not less respectable.

Your committee, in considering this subject, have endeavored to ascertain the possible practical utility of the proposed rail-road

¹ McClure, *Old Time Notes of Pennsylvania*, Vol. 1, pp. 123-124.

with an eye to the results upon the feelings and interests of that section of the country through which it is to pass; and have been led to the conclusion, that the act of incorporation prayed for, would not be favorable to the interests or feelings of the inhabitants more immediately concerned in the location of the rail-road. There is now a turnpike communication from Brooklyn to Jamaica, inferior perhaps to none in the State in point of ease and convenience for public accommodation. The rights and interests of this company would be seriously involved in the construction of a rail-road connecting the same villages; and as no intermediate stations are designated in the petition, the committee has inferred that the route of the contemplated railway would be nearly parallel and contiguous to the present turnpike, and destructive to the interests of that company, who also remonstrate in corporate capacity.

From a careful consideration of the subject committed to your committee, they have been unable to perceive sufficient reasons to justify them in a report favorable to the prayer of the petitioners, and therefore recommend the adoption of the following resolution:

Resolved, that the prayer of the petitioners ought not to be granted.¹

The promoters of the railroad, following the denial of their first petition, made arrangements to purchase the turnpike, and again asked the legislature for a charter authorizing the construction of the railroad. The charter was granted in 1832, the twenty-seventh section of the act of incorporation containing the following provisions:

The rail-road company hereby created shall, on the fifteenth day of May next, or as soon thereafter as the necessary arrangements for that purpose can be made, purchase the stock of the Brooklyn, Jamaica and Flatbush turnpike company, at the rate of twenty-six dollars per share in cash, or shall pay them for the said stock at the rate of twenty-three dollars a share in railroad stock of the said company at par, at the option of each stockholder.²

The steam railroad soon demonstrated its superiority over the turnpike as a carrier of freight and passenger traffic, and the owners of turnpikes found it impossible to prevent the incorporation of new railroad lines. In some cases they saved themselves from serious loss by acquiring stock in the new railroad companies, or by inducing the legislature to insert in the acts of incorporation of railroads provisions for compensation for whatever damage they might sustain because of railroad construction. In 1835 the Seneca Turnpike Company presented a memorial to the New York legislature seeking

¹*New York State Senate Document Number 63, 54th Session, 1831.*

²*Laws of New York, 1832, Chapter 256.*

relief from prospective ruin. This company had been chartered in 1800, and had built a turnpike from Utica to Canandaigua, with branches from Chittenango through Salina to the east shore of Cayuga Lake. The cost of constructing the road had been \$162,000, and because of the heavy expense of upkeep during the early years, when traffic had been comparatively light, the profits of the company had been very small. The country along the road had been settled rapidly after the highway was built, however, and for a time the company was fairly prosperous. Then the Erie canal had been constructed, and it at once swept from the turnpike "all the teaming, and almost all the public travel except that passing in stage coaches." The memorialists stated:

That they have recently been informed, through the medium of public journals and otherwise, that applications have been made and are now pending before your honorable body, for the enactment of laws authorizing the construction of rail-roads, to extend, one from the city of Utica, in the county of Oneida, to the village of Syracuse, in the county of Onondaga, and one from the village of Auburn in Cayuga county, through Geneva and Canandaigua, to the city of Rochester, in Monroe county; and that, although your memorialists do not intend or desire to assume an adversary attitude towards the said applications, still, as guardians of the rights and interests of the Seneca road company, they deem it their duty to call the attention of your honorable body to the natural, and, as your memorialists fully believe, certain and inevitable effect of the construction of the roads contemplated in such applications, upon those rights and interests. . . .

And your memorialists further represent, that in their view, all that section of the said road lying between Utica and Syracuse, and also that between Auburn and Cayuga lake, will be rendered entirely unproductive and valueless to the company, by the construction of the contemplated rail-roads . . . as, owing to the greater expedition of rail-road conveyance, all the public travel in stage coaches and otherwise, and all the teaming now using these sections and parts of the said road will be at once diverted, and nothing will be left upon the road but the occasional light neighborhood travel; the income from which will not even pay the expense of keeping up gates, much less that of necessary and unavoidable repairs. And thus the whole capital of the said company, already greatly depreciated by the injurious operation upon it of the several causes hereinbefore adverted to, particularly the construction of the grand canal, will, your memorialists believe, be sacrificed, sunk, and irretrievably lost to its holders, unless the rights and interests of the company shall receive protection at your hands. . . .

Your memorialists . . . respectfully submit . . . that

should acts be passed in pursuance of the applications aforesaid, they should each contain a provision, or provisions, requiring the corporations or associations to be created thereby, to arrange with the said company in such manner as shall ensure justice to all parties, the amount of damages which the company shall be adjudged to sustain, in consequence of the construction of such rail-roads, and requiring also that such arrangement both as to the sums to be paid, and likewise the mode and time of payment shall be completed, before the said corporations or associations shall be allowed to proceed in their operations.¹

That this memorial was not without effect is shown in the seventh section of the act of incorporation of the Syracuse & Utica Railroad Company, providing that the railroad company should pay to the owners of the Seneca road company "the amount of damages which said road company may sustain by the construction of the railroad hereby authorized."²

When the Mohawk and Hudson Railroad was opened in 1831 there was an immediate decline in the traffic passing over the Albany and Schenectady turnpike. The directors of the turnpike company, having foreseen the probable effect of the construction of the railroad, had, in 1830, secured the enactment of a law authorizing them to extend their road "in the county of Albany; and to convert about eighteen feet of their turnpike in the same county of Albany, into a railroad or way."³ The Albany terminus of the Mohawk and Hudson Railroad was on the south side of the city. The turnpike company announced a plan of converting its highway into a railroad, with its eastern terminus near the center of Albany.

The directors of the Mohawk and Hudson Company claimed the exclusive right, under their charter of 1826, to operate a railroad between Albany and Schenectady, and they at once entered a vigorous protest against the proposed action of the rival carrier.⁴ A compromise was finally reached under the terms of which the Mohawk and Hudson Company was to build a branch line into the main business district of the city of Albany. It was to increase its capitaliza-

¹*New York Assembly Document, No. 148, 58th Session, 1835.*

²*Laws of New York, 1836, Chapter 292.*

³*Ibid.*, 1830, Chapter 319.

⁴The claim of the Mohawk and Hudson Company to the exclusive right to operate a railroad between Albany and Schenectady rested upon the eighteenth section of the act of incorporation (*Laws of New York, 1826, Chapter 253*): "That nothing in this act contained shall be so taken or construed as to prevent the present or any future legislature from authorizing the construction of a railroad or roads from any city or village other than from the city of Albany, to any other place or places in this State."

tion by \$100,000, and the stockholders of the turnpike company were to have the privilege of purchasing the new railroad shares at par, though at the time the shares of the railroad corporation were selling at a premium of about thirty percent. The compromise agreement of the two companies was submitted to the legislature, and a law was enacted in 1832 authorizing the execution of the plan. The Mohawk and Hudson Company was permitted to construct a branch "from the line of their present railroad, at or near its intersection with the great western turnpike, to Capitol square in the city of Albany, and from thence, or from some point between the said place of intersection and Capitol square, to the Albany basin." The increase of capitalization was authorized, and the stockholders of the Albany & Schenectady turnpike company were granted the right to purchase the new shares at par.¹

The early railroad companies of Massachusetts and other New England states met with strong opposition on the part of turnpike companies and stage lines. The historian of the Eastern Railroad describes as follows the first attempt to procure a charter for a railroad between Boston and Salem:

As early as 1832 there was a project for a railroad between Boston and eastern points, for that year Thomas H. Perkins, Philip Chase, George Blake, David Henshaw, William H. Sumner, and others petitioned the Legislature to charter a railroad from Boston to Salem. There were two plans, one route to end at Winnisimmet (Chelsea), and the other at Noddles Island, (East Boston), and then to ferry across the harbor to the city proper, but owing to the strong opposition from the Salem Turnpike and Chelsea Bridge Corporations and from the ship-owning interests in Chelsea, which were afraid that navigation for vessels would be interfered with, the charter was refused. There were also strong remonstrances from Lynn, as the several mills situated on the Saugus river above the Salem turnpike were afraid that the proposed drawbridge would prevent coasting vessels from loading and discharging cargoes at their wharves. The whaling industry of Lynn, then employing three vessels, were afraid their business would be utterly ruined for the same reason. At that time thirty stages ran daily between Boston and Salem, and the Senate committee thought that would suffice. Doubts were expressed whether the travel would be as great as the projectors of the railroad estimated, and one member of the Senate com-

¹*Laws of New York, 1832, Chapter 79.* The compromise between the rival companies was discussed in a report of a committee of the Assembly, to which the proposal for the enlargement of the powers of the railroad company was referred. *New York Assembly Document Number 36, 55th Session, 1832.*

mittee thought "that persons owning fine horses and carriages would certainly not give them up to ride in dirty steam cars."¹

Three years later another group of men organized a company to build a railroad from Boston to Newburyport, by way of Salem. Subscriptions to the stock of the organization were invited, and a committee appointed to obtain a charter from the legislature. This committee, of which George Peabody was chairman, presented a petition to the legislature, in September, 1835, signed by fifteen hundred citizens. The petition was not acted on at once, but referred to the next session of the legislature. Mr. Peabody's report to the stock subscribers, made after the charter was finally procured, contained the following statement:—

This delay afforded the adversaries of our project ample time to organize and combine their hostility, and accordingly, when the subject was called up in the January session, a most formidable opposition was presented, and seemed for a while to threaten a speedy annihilation of our hopes for a charter. After a hearing of seventeen or eighteen days, before the committee of the Legislature, during which time every possible objection was urged which the ingenuity of ten or twelve professional gentlemen with their friends could devise, a bill was reported in our favor.²

It is easy to understand the opposition of the turnpike, stage line and teaming interests. The railroad was destroying their business, and they were suffering, just as skilled laborers suffer when they are displaced by machines. An old wagoner wrote to the historian of the Cumberland Road:

While the writer was wagoning on the old Pike, the canal was made from Cumberland to Harper's Ferry. The Pike boys were bitterly opposed to the railroads and so were the tavern keepers. The writer heard an old tavern keeper say "he wished the railroads would sink to the lower regions."³

But it was useless for the opponents of the railroad to struggle. The "good old ways" were passing.

When at last, the Conestoga horse yielded up the palm to the Iron Horse, and it became manifest that the glory of the old road was departing, the old wagoners, many of whom had spent their best days on the road, sang in chorus the following lament:—

¹ Francis B. C. Bradlee, *The Eastern Railroad*, pp. 3-4.

² Quoted in Bradlee, *The Eastern Railroad*, p. 10.

³ A letter from John Deets, in Thomas B. Searight, *The Old Pike, A History of the National Road*, p. 121.

"Now all ye jolly wagoners, who have got good wives,
Go home to your farms and there spend your lives,
When your corn is all rubbed, and your small grain is good,
You'll have nothing to do but curse the railroad."¹

The opposition of canal interests to the introduction and development of steam railroad transportation was more vigorous than the opposition of turnpike interests. A canal usually represented a much larger investment than a turnpike, and the incentive to keep competitors out of the field was therefore stronger. Then too, canal interests were able to secure greater public support than turnpike owners. The leading artificial waterways were state enterprises, and most of them were constructed with borrowed money. Should these waterways be unable, because of railroad competition, to earn enough to pay for their cost, the debts incurred for their construction would have to be met with taxes. The public at large had therefore a distinct pecuniary interest in maintaining the business of the canals. Another factor which favored the canal interests was that the question of the relative efficiency of canals and railroad as carriers of general freight traffic was not settled so easily as the question of the relative advantages of railroads and turnpikes for the transportation of passengers. The canal afforded a much cheaper means of transportation than the turnpike, and in some respects it was a cheaper agency than the railroad, and just as efficient. Occasionally the railroads were handicapped in the struggle for supremacy because state governments had means of meeting undesired competition which would not have been available to private corporations.

The opposition of canal interests to railroads was especially strong in the Eastern States. In the West and South railroad construction was not started on an extensive scale until after the railroad had been thoroughly tested and proven in the East. Moreover in the West and South few of the early railroads were built parallel to existing waterways, either canals or rivers. In New England and in the Middle Atlantic States, on the other hand, the important early railroads were built virtually alongside the canals, and a keen rivalry existed from the beginning. The canal interests did not relish the prospect of competition. They tried to prevent the incorporation of railroads, and failing in this, they endeavored by adverse legislation, to neutralize whatever natural advantage the railroad possessed.

¹Searight, *The Old Pike*, p. 145.

Mention has been made of the rivalry between the Chesapeake and Ohio Canal Company and the Baltimore and Ohio Railroad Company. In New Jersey the Camden and Amboy Railroad Company and the Delaware and Raritan Canal Company started out as rivals, but composed their differences by consolidating into a single corporation. In New England the canal companies strenuously opposed the construction of railroads. The Middlesex Canal Company protested against the incorporation of the Boston and Lowell Railroad Company in 1830,¹ and similar protests were made by canal companies against other railroads.

It was in New York, however, where the most spectacular struggle between canal and railroad took place. The Erie Canal was the most successful of all the early artificial waterways. It gave New York the commercial leadership of the nation; it was also a great financial success, the tolls collected being sufficient to meet operating expenses and reimburse the treasury for the original cost of construction. When attempts were made to extend a line of short railways from Albany to Buffalo, following the route of the canal, the legislature was torn by conflicting sentiments, a desire to preserve the revenues of the state waterway and a wish to let the state have steam railroads, which, for some purposes at least, were obviously superior to canals. Governor E. T. Throop, in his message to the legislature, January 3, 1832, recommended that railroad charters be granted with discretion, saying:

In lending a favorable ear to these projected improvements upon routes contiguous to, and intersecting our canals, or pointing to the sources of their trade, the Legislature should be extremely careful to do nothing which may interfere with the canal revenues, or retard the payment of the debt. It is supposed that companies may be formed to take charters for rail-roads upon the most important routes, with the condition of paying into the public treasury such rates of toll, that no loss of revenue will result from their interference with the business of our canals.²

In chartering the second link of the central line of railroad in New York, the legislature went farther even than the governor had suggested. The Utica and Schenectady Railroad Company was authorized to "transport, take and carry passengers and their ordinary baggage," but was forbidden to transport freight. The tenth section of the act of incorporation stated: "No property of any description, except the ordinary baggage of passengers, shall be trans-

¹*Boston Daily Advertiser*, February 15, 1830.

²*New York Assembly Document Number 2*, 55th Session, 1832.

ported or carried on the said road.”¹ This was the only New York railroad that was forbidden to carry freight.

The charter of the Auburn and Syracuse road, granted in 1834, required the railroad company—

to pay to the commissioners of the canal fund, the same tolls on all goods and other property transported, taken and carried on the said road or ways, except the ordinary baggage of passengers, as may at the time of such transportation on the said rail-road or ways, be required to be paid to the state on the same kind and description of goods and other property transported, carried, and conveyed on the Erie Canal.²

The charter of the Auburn and Rochester Railroad Company, granted in 1836, contained the somewhat ambiguous provision, that the corporation hereby created shall not take and transport merchandise or property in such manner as to lessen the income of the Erie Canal during the time when the canal is navigable.³

The Syracuse and Utica Railroad Company, also chartered in 1836, was required during the season of canal navigation, to pay to the commissioners of the canal fund such tolls on all goods and other property transported . . . except the ordinary baggage of passengers, as the canal board shall deem proper, but not exceeding the rates of toll charged upon like property upon the said canal.⁴

The Attica and Buffalo Railroad Company and the two roads which composed the eastern part of the central line—the Mohawk and Hudson and the Schenectady and Troy—were not required to pay tolls under the terms of their charters.

In 1844 the charter of the Utica and Schenectady Company was amended, to permit the road to carry freight “during the suspension of canal navigation in each year only,” but it was stipulated that the company should pay into the canal fund “the same tolls per mile on all goods, chattels and other property transported, as would have been paid on them had they been transported on the Erie Canal.” The same act required the Syracuse and Utica, the Auburn and Syracuse, the Auburn and Rochester, the Tonawanda, and the Attica and Buffalo Railroads, to pay the same tolls as were required of the Utica and Schenectady, but the canal board was directed to make regulations concerning the roads west of Utica—

¹*Laws of New York*, 1833, Chapter 294.

²*Ibid.*, 1834, Chapter 228.

³*Ibid.*, 1836, Chapter 349.

⁴*Ibid.*, 1836, Chapter 292.

so as to continue to said roads the privilege of transporting local freight without the payment of toll, wherever they now enjoy that privilege, and to enforce and ensure the collection and payment of tolls on all such freight as shall be carried on the said roads by reason of the privilege in this act granted to the Utica and Schenectady railroad.¹

The managers of the railroads west of Utica soon became involved in a controversy with the members of the canal board as to the meaning of the terms of this law. There was a difference of opinion as to what constituted local freight, and there was also some difficulty in ascertaining what freight carried on the roads west of Utica was carried "by reason of the privilege" granted to the Utica and Schenectady line.

In 1847 the legislature clarified matters somewhat by enacting another measure dealing with the question of tolls. In this law all restrictions upon the right of the Utica and Schenectady road to carry freight were removed, and the practice of charging tolls on railroad freight was extended to all the roads which made up the "central line" from Albany to Buffalo, including even the Albany and Schenectady (formerly the Mohawk and Hudson) and the Schenectady and Troy roads, which previously had escaped the requirement of paying tolls to the state. The only exception made was that the roads west of Utica were confirmed in their right to carry local freight without the payment of tolls in all cases where such right had formerly existed.²

In 1848 the principle of imposing canal tolls upon railroads was still further extended, the general railroad law of that year providing that any railroad company formed under the law, the line of which should run parallel or nearly parallel to a canal owned by the state, should be required to pay tolls upon all property carried except the baggage of passengers.³ The general railroad law of 1850 continued this policy.⁴ Another act passed in 1850, however, provided that "neat cattle, horses, sheep and fresh meats, may hereafter be transported upon any railroad in this state, without being liable to the payment of canal tolls."⁵

In 1851 the legislature abandoned its policy of discriminating against the railroads, and enacted a law abolishing all canal tolls

¹*Laws of New York*, 1844, Chapter 335.

²*Ibid.*, 1847, Chapter 270.

³*Ibid.*, 1848, Chapter 140.

⁴*Ibid.*, 1850, Chapter 140.

⁵*Ibid.*, 1850, Chapter 268.

which railroad corporations had previously been compelled to pay.¹ The railroad companies had for several years been strenuously objecting to the payment of these charges. It was apparent that the central line of railroads—about to be consolidated into a single system—would be at a serious disadvantage if the collection of tolls were continued on that route and no tolls imposed upon the New York and Erie Railroad, which in 1851 was opened between Piermont and Dunkirk. There was an animated discussion of the entire question of canal tolls in the legislature. For several years canal receipts had been large, and the fear of successful railroad competition had been in a measure dissipated. As a result no great difficulty was encountered in securing the enactment of the law for the abolition of the obnoxious tolls.

After the passage of the act exempting railroads from the payment of canal tolls there was a sharp decline in canal traffic, and a marked decrease in the canal revenues. The decline in traffic was due in part to the general economic conditions of the country, but it was chiefly due to the fact that the trunk line railroads, by lowering their freight rates, were able to attract some of the freight that had previously passed through the canal. The reduction in railroad rates was caused partly by the desire of the railroad managers to “capture” the canal traffic, but the chief cause was the intense competition among the railroads themselves. The State Engineer and Surveyor of New York, in his *Annual Report on Railroad Statistics* of 1855, criticised the excessive reduction of railroad rates. He said:

The charges for transportation have been reduced to the present low rates from a mistaken opinion that it is necessary for the public to be shown large receipts, to accomplish which it was necessary to enter into competition with rival roads and water lines. . . .

The alleged necessity of showing large receipts still exists; and the attempt to maintain the business diverted from rival roads being abandoned, a competition with water lines is commenced, for the transportation of the heavy and cheap articles of freight, which can only be maintained by rates nearly or quite as low as those charged upon lakes, rivers and canals, and too low . . . to give a fair remuneration to the railroads. . . .

Sufficient information has been elicited from the railroads in this and other States from the actions of the conventions,² and from

¹*Laws of New York*, 1851, Chapter 497.

²Railroad conventions had been held for the purpose of bringing excessive railroad competition to an end.

other sources of information, to warrant the belief that a considerable portion of freighting business now done by your railroads yields no profits at the present rates ¹

His conclusion that the railroads were carrying a portion of their traffic at a loss was based in part upon the annual report of his predecessor in office, published in 1854. This report had given a somewhat elaborate history of the development of the railroads and canals of New York, and had presented figures purporting to show that the cost of transportation by rail was more than twice the cost of transportation by canal.²

For several years the State of New York had been engaged in enlarging the Erie Canal. The cost of the improvement had been heavy, and it was now apparent that to meet this expense and the expenses of operating the canal system, the State would be obliged either to take steps to increase the canal revenues or to resort to an increase in the rates of taxation. The Auditor of the Canal Department, in his annual report of 1855, *The Tolls, Trade and Tonnage of the Canals of New York*, called attention to the declining revenues of the canal system, asserting that "the diversion of tonnage by the railroads from the canals is of great and serious character." Referring to the railroad managers who had reduced their rates for the purpose of diverting tonnage from the State waterways, he said:

Such railroad operators are, . . . in violation of the trust and confidence reposed in them, by the stockholders upon the one hand, and the State which gave them existence as a corporation on the other, working a double injury. And the State, by a proper, judicious, and equitable imposition of canal tolls, will perform a double duty; protect their own revenues from loss and injury by the recklessness of individuals, and aid the injured stockholders by preventing the possibility of competition, and thus destroying the temptation for such departures from a legitimate and profitable to a ruinous and losing business.³

The suggestion that the State return to the policy of imposing tolls upon those railroads which competed with the canals, met with favor in the eyes of Governor Myron H. Clark. In a special message to the legislature, March 20, 1855, he said:

There is no interest of the State of greater importance, or

¹*New York Senate Document Number 35, 78th Session, 1855.*

²*New York Senate Document Number 60, 77th Session, 1854.*

³*New York Assembly Document Number 95, 78th Session, 1855.*

which has a more extended influence upon its growth and prosperity than its works of internal improvement. They are enduring and valuable monuments of the wisdom and foresight of those who projected them and have, to an incalculable degree, developed the resources, increased the wealth, and contributed to the general prosperity of the commonwealth. It is the duty of the legislature, therefore, to guard jealously their interests and to secure to them that degree of protection which their importance and the vested right of the State alike demand

A comparison of the business of the State canals and several of the principal railroads for the years 1853 and 1854. . . shows conclusively that the transit of freight is to a very great extent, and much to the injury of the State, diverted from the State canals to railroad lines. . . .

This diversion existing and rendering taxation necessary, justice and equity would single out the institutions creating and reaping the benefits of diversion as those which should be required to meet the burdens.

The true and only policy, in my opinion, is the imposition of canal tolls upon the railroad tonnage of all the railroads diverting business from the canals. . . .¹

A majority of the committee on ways and means of the assembly made a report recommending the reimposition of tolls upon the railroads competing with the canals.² It was not possible, however, to secure the enactment of a bill embodying the recommendations of the majority of the committee. During the following five years several attempts were made to bring about a return to the policy of imposing canal tolls upon railroads, but all such attempts resulted in failure. The tolls were never restored, and the canal debts were met with taxes.

In Pennsylvania also, there was a conflict between state authorities and railroads because of railway competition with the Pennsylvania Public Works. The controversy was of comparatively short duration, however, because the legislature adopted the policy of selling the State canals to railroad corporations. The canal commissioners of Pennsylvania, like those of New York, believed that canals were superior to railroads as carriers of freight. They were inclined to discourage the construction of railroads, and when railroads were built, they declined to cooperate with railroad managers for the improvement of the transportation service.

Pennsylvania also followed the policy of imposing tolls upon

¹*New York Assembly Document Number 97, 78th Session, 1855.*

²*New York Assembly Document Number 107, 78th Session, 1855.*

the freight traffic of railroads which competed with State canals. The act providing for the incorporation of the Pennsylvania Railroad Company placed a tax of five mills per mile upon each ton of freight "carried or conveyed over said railroad more than twenty miles, between the tenth day of March and the first day of September of each year."¹ In 1848 this tax was commuted to a tax of three mills per ton per mile upon all freight carried on the railroad throughout the year.²

In 1852, when the Pennsylvania Railroad Company established a through service between Lancaster and Pittsburgh, it endeavored to have its passenger cars hauled on the tracks of the State railroad between Lancaster and Philadelphia, just as the cars of other companies and of individuals were hauled. The canal commissioners excluded the railroad company's cars from the State railroad, and proceeded to grant a virtual monopoly of the passenger service between Philadelphia and Columbia to a transportation firm in Philadelphia. The railroad company protested against this action and appealed to the courts for relief. The courts upheld the canal commissioners, on the grounds that the Pennsylvania Railroad Company's charter did not expressly give the company the right to operate its cars on the State Railroad.³ In 1853 the legislature came to the aid of the railroad company, passing an act giving it the right to have its cars passed over the State works, thereby putting an end to the canal commissioners' policy of discrimination.⁴

In 1857 the legislature authorized the sale of the Main Line of Pennsylvania Public Works. The law authorizing the sale provided that if the Pennsylvania Railroad Company should purchase the State works, the company could, in return for \$1,500,000, payable in five per cent. bonds, obtain exemption from the tonnage taxes previously imposed and from all other taxes to the State except for school, city, county or borough purposes.⁵ This particular provision of the law was declared to be unconstitutional by the Pennsylvania Supreme Court,⁶ and technically the three mill

¹*Laws of Pennsylvania*, 1846, Number 262.

²*Ibid.*, 1848, Number 224.

³*Pennsylvania State Reports*, XXI, p. 9. For an account of the controversy between the canal commissioners and the railroad company see the annual reports of the canal commissioners and of the Pennsylvania Railroad Company for the years 1852 and 1853.

⁴*Laws of Pennsylvania*, 1853, Number 110.

⁵*Ibid.*, 1857, Number 579.

⁶*Pennsylvania State Reports*, XXX, p. 9.

tonnage tax was restored, remaining in effect until 1861, when it was unconditionally repealed.¹

Narrow Conception of the Use of the Railroad

One of the most persistent obstacles to the rapid development of efficient railroad transportation in the United States was the limited conception, both on the part of the public and on the part of railroad executives, of the use of the railroad. The first railways were built to serve small localities, to connect one town with another town, to join lines of water communication in places where the construction of artificial waterways was not feasible. It took a generation for the idea of a railroad serving a large portion of the country firmly to take root, and it took almost two generations to develop the idea of great national railroad systems.

The creation of such systems as the New York Central and the Pennsylvania showed how railroad service could be improved by the consolidation of short connecting lines. The early railroad systems seldom extended, however, beyond state boundaries. Various railroad companies displayed an interest in building up state railroad systems, but there was a reluctance to embark in large schemes of consolidation. The eastern trunk lines were interested in having good feeders on the west, and even aided in financing the construction of such feeders, but there was for a time no disposition to consolidate with these western lines. The Pennsylvania Railroad Company, for example, had a substantial investment in the Ohio and Pennsylvania Railroad, which in 1856 became a part of the Pittsburgh, Ft. Wayne and Chicago Railroad, but the Pennsylvania directors were glad, during the Civil War, to dispose of their holdings of the stock of this important connection. In a similar way the Baltimore and Ohio sold its stock in the Northern Central between Baltimore and Sunbury. This stock the Pennsylvania Railroad bought up at bargain prices, primarily because it gave a greater degree of control over traffic within the State of Pennsylvania.

The most telling evidence of the shortsightedness of railroad managers and of the public was the multiplicity of gauges employed in the construction of the first railroads of the United States. There was little or no indication of a belief that a uniform gauge was

¹*Laws of Pennsylvania*, 1861, Number 100.

desirable, until circumstances virtually compelled the extension of railroad systems beyond state boundaries.

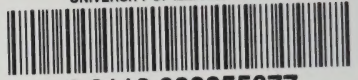
There was a wide diversity in the gauges of the early railroads. Most of the lines in New England had the standard gauge (4 ft., 8½ inches), although the Atlantic and St. Lawrence, which passed under the control of the Grand Trunk, had a gauge of 5 feet, 6 inches, as did a few other lines in Maine. The New York Central Railroad had a gauge of 4 feet, 8½ inches, but the Erie and the Delaware, Lackawanna and Western had a gauge of 6 feet. Most of the railroads in New Jersey, including the Camden and Amboy and the lines of the New Jersey Railroad and Transportation Company, were built with a gauge of 4 feet 10 inches, but the Central Railroad of New Jersey and the Camden and Atlantic were built with the standard gauge. The Central had a third rail to permit the passage of the six-foot cars and locomotives of the Delaware, Lackawanna and Western, which used the Central's line to reach Elizabethport. The Pennsylvania Railroad was built with the standard gauge. In Ohio the prevailing gauge was 4 feet 10 inches, but there were a few lines with standard gauge, while the Ohio and Mississippi had a gauge of 6 feet, the Eaton and Hamilton 5 feet 10½ inches, the Scioto and Hocking Valley and the Sandusky, Mansfield and Newark 5 feet 4 inches, and the Cleveland and Toledo 4 feet 9¼ inches. In Indiana and Illinois the standard gauge predominated. In Missouri the prevailing gauge was 5 feet 6 inches, though the Hannibal and St. Joseph had the standard gauge. In the Southern States east of the Mississippi River virtually all the railroads were built with a gauge of 5 feet, there being a greater degree of uniformity in these states than in any other part of the country. In the law incorporating the Union Pacific Railroad Company, Congress authorized the President of the United States to establish the gauge of the railroad. After Lincoln had issued a proclamation establishing a gauge of 5 feet, Congress passed a bill requiring the railroad to be constructed with the standard gauge of 4 feet 8½ inches.

Occasionally the gauge of railroads was changed to permit the operation of through trains. Sometimes there was opposition to a change of gauge. Cities in which there was a break of gauge had a certain amount of transshipment business, which was lost when gauges were made uniform. In the winter of 1853-54, the citizens of Erie, Pennsylvania, angered because the gauge of the Erie and

North East Railroad had been reduced from 6 feet to 4 feet 10 inches, to correspond to the gauge of the railroad leading west from Erie, repeatedly tore up the tracks and burned the bridges of the railroad, interrupting rail communication between Erie and New York for several weeks.

It was not until after the Civil War that the people of the United States began to realize the full benefits of the steam railroad. The rapid development of the agricultural resources of the interior of the United States, which came with the extensive use of farm machinery, brought about an enormous increase of railroad traffic. In 1869 the Union Pacific-Central Pacific line was completed between the Missouri River and the Pacific Coast. It was becoming evident that the steam railroad could serve as an efficient carrier of freight, whatever the character of the traffic and whatever the distance of the haul. Cheap steel and the air brake prepared the way for heavier and faster trains. There came a new conception of the possibilities of the railroad, and old methods of conducting the business were discarded. The keen competition among the eastern trunk lines for western business made it necessary for these lines to secure exclusive control of their leading western connections. During the five years following 1868 consolidation and new construction brought into existence a group of great national railways which were to exercise a dominating influence upon the transportation business of the country. Uniformity of gauge became a necessity. The time had arrived for the development of railroad transportation on a scale undreamed of when the first railroad was constructed. All doubt as to the superiority of the railroad over previous methods of transportation vanished, the opposition to the railroad as a carrier of freight gradually died away, and the obstacles to railway expansion disappeared.

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